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University Chronicle

VOL. IV FEBRUARY, 1901 No. 1

UNIVERSITY DEMOCRACY.*

By BENJ. IDE WHEELER.

As we approach another fateful Thanksgiving Day our hearts and our hopes are all united in the work of those who are to represent us on the arena. We are many individuals; each has his own lessons to learn and his own dinner to get; one worries about analytic mechanics, another about the theory of equations; the ambition of one seeks earnestly unto the third grade, the heart of another will fail if he fall short of unanimous firsts; one has his eye on an editorship, another on a class-presidency, another on a Phi Beta Kappa key, another on shoulder straps; some think the ideal man is the one who knows most about crushing, drilling, cupellation, and scorification; others find him in the one who consorts with Aquinas and Scotus, Hegel and Kant. A modern university is indeed a strange mixing-bowl in which all the ambitions, all the views of life, all the scientific zeals, all the forms of personal strength meet and gain expression. We are many individuals with many individual notions and many individual aims, but we can all be one and are one in our solicitude for Pringle's knee.

It may be a very noisy thing, and a very undignified thing to do, to join the great *concentus virtutum* which rises

*The President's address to the students at the University Meeting, November 23, 1900.

from the rooter's section on the great field day, but it is our way,—a crude way, but all the same, our way, our well-intentioned way of saying that we are one, one people, one household, one life. We have some one thing we are interested in, one thing we are in earnest about; we are utterly, finally, and irrevocably committed to the view that there is one particular side of the field where that ball must go.

If the old university was so named because it was the assemblage into one bond of all the guilds and clubs, and schools, the modern university holds the title because it is an assemblage into one of all the colleges, all the courses, all the life-aims, and all the generous ways of reaching them.

A university is a place that rightfully knows no aristocracy as between studies, no aristocracy as between scientific truths, and no aristocracy as between persons. All that can make one man's study better than another's will be the devotion and clear-headedness with which he pursues it. All that can make one doctrine nobler than another will be its deeper reach toward a solid foundation in those eternal verities on which the world stands. The light-house, not the wind-guage, is our symbol. All that can make one student better than another is cleanness of soul, cleanness of purpose, cleanness of thought, and cleanness of life.

The home is democratic, not because there are no weak ones in its bond, but because no one is overlooked and despised because he is feeble, and because all are united by the common hearthstone and in the mother's love. The university is democratic, not because there is within it no diversity of talents and of worth, but because all are judged by higher standards than those of blood or birth or influence, because every man has a man's chance, and all are united in ideal loyalty to real truth.

I may be speaking to no present need, but if there be any of you who have been led astray into the service of the false gods of social distinction, I abjure you in the name of

the academic faith that you forsake your sins and return to the altars of Athena. Let the university be what it is set to be, the home of the intellectual democracy. Do not bring in here and do not suffer anyone to bring in here any ghostly similitudes of those discriminations which divide people in the outer world according to prejudice of family, riches, race, and occupation. Do not tolerate in yourself, do not recognize in others an arbitrary self-rating according to unreal tests, such as family connections, membership in particular bodies, and worldly possessions. This is a place where "handsome is as handsome does."

THE DECLINE OF GREECE.*

By W. S. Ferguson.

By Greece is meant the Greek people. This undoubtedly reached an exceedingly high stage of civilization which it did not maintain. Much new light has recently been thrown on its rise. The Homeric poems are not now unintelligible phenomena standing as enigmas in the gray dawn of Greek history. Long vistas have been opened to view reaching far back of the times in which these poets lived, and the historian of Greece no longer begins with a criticism of the Homeric and Hesiodic myths, but rather makes that the opening chapter of his second book. The first book deals with the Mycenaean age, its rise and fall. It is not with the decline of this, the earliest Greek civilization, that I have to deal here. That was not final. A new era of advance followed, reached its climax, and in turn declined.

Asia Minor was the scene of the Renascence. In the Aeolic and Ionic cities the fresh spirit of the expanding age, acting upon traditional material and using traditional forms of expression, produced the Homeric poems. A little later, acting on contemporary life and using new forms of expression, it produced the lyrics of Sappho and Alcaeus, the bitter invective of Archilochus and the enlightenment of the Ionian philosophers. But when in 493 Miletus, the greatest city in the Greek world, fell, the prosperity of Ionia

*Read before the Historical Section of the California Teachers' Association, December 28, 1900.

came to an end. The Persian Wars brought independence to the coast cities but also the enmity of the *hinterland*. Trade with the interior had been the main artery of Miletus, Ephesus, and the other Greek foundations. This was cut by the hostility of Persia and the Athenian Empire, and Ionia languished. At the same time Athens advanced. Its citizens were inspired by their glorious share in the war of independence; its empire gave it the carrying trade of the Aegean; its splendid harbor made it the meeting place for the shipping of the world; its situation was equally advantageous for trade with Egypt, Thrace, the Hellespont, the Black Sea region, and Italy; manufacturing on the large scale began and slaves were imported by the thousands. The center of commercial and industrial, artistic and intellectual life passed, after the Persian Wars, from Miletus to Athens. Here it remained for upwards of two centuries, though Syracuse threatened all the while to draw it still farther westward. In 338 Athens was still, in all but political strength, the leader of Greece—of the new Greece which had succeeded that of Mycenae and Cnossus.

This is the Greece of which Grote wrote. But Grote fixed his glance on one part of it only. Athens meant for him Hellas. For him the failure of democratic Athens was the failure of the Greek people. Its decline was complete when Philip won at Chaeronea. "With sadness and humiliation he brings his narrative to a close" with the career of Demosthenes' nephew, whose greatest boast it was to have won gifts for Athens from contemporary sovereigns. It was no justification for Democharés that he went into exile for the political principles supposed by Grote to have been dead, and employed the money given by the kings to oust a foreign garrison from the walls of Athens. Grote did not mention the fact that the leading statesmen of Greece had done the same thing, when Greece had not even the excuse of political weakness to justify such conduct. Nor did he give the third century Athens credit for its heroic attempts, renewed again and again, to maintain its freedom and

neutrality in the face of a kingdom which the fifth century Athens would have been powerless to resist. A people which five times in a hundred years rises in revolt against a foreign domination has not lost its love of freedom. Surely the greatness of Athens, if that consists in its love of freedom, does not end with Chaeronea! Nor is Athens equivalent with Greece. Macedon itself was a Greek nation; Alexander was a Greek conqueror; the history of the Greek people continues, modified by Chaeronea, but not ended.

Curtius also wrote the story of this same Greece. But Curtius was a greater artist than historian, and his standard of measurement was an aesthetic standard. Using this, he found the latter part of the fourth century marked by a decline in creative genius in art and literature. The Hellenistic period but imitated the types created in the Hellenic period, and the imitations soon fell far short of the originals. But the aesthetic standard is an incomplete measure of a nation's greatness. It takes account of the flower of a civilization only, and this may reappear if the roots are not cut. Greece had once already "renewed its mighty youth." The Dorian invasion destroyed the bloom of the Mycenaean age, but none the less a new bloom came. And, as Jakob Burckhardt in his recent History of Greek Culture has emphasized, the possibility for the growth of a civilization of the highest rank is not wanting so long as the necessary political and economic foundations remain. These *did* remain in the Hellenistic era. For at that time the Greek people built cities which had hundreds of thousands of inhabitants for the tens of thousands of the fifth century capitals; it handled talents where the old Greeks had handled minas; it constructed roomy and comfortable dwelling houses whereas the victors at Salamis had lived in hovels; it knew empires within which one could travel a thousand miles in the same direction whereas the old states lay, as Aristotle claimed they ought to lie, for the most part within the horizon of the soldiers on their citadels, and the rights of intermarriage and intertrade (*connubium*

et commercium) were the common possessions of a whole world. The foundations for a new and broadened culture were thus by no means wanting.

It is a right doubtful assertion, moreover, that the third century entirely failed in artistic creations. The Venus de Milo is perhaps a blending of the spirit of the fifth century with the grace of the fourth and as such is not new. But what of the frieze of the great altar of Zeus at Pergamon? What of the works of the Rhodian school? It is, at any rate, more correct to speak with Overbeck of an "after bloom" than of a decline of art in this century. What was wanting was the religious inspiration of classic Greece, but this very lack makes it appeal all the more to us moderns whose religious atmosphere is not Greek. Its originality is evident in its realism and its range of subjects; in technique it could but hold its own, and that was enough. Moreover the art of symmetrical arrangement was developed. The Acropolis at Athens in the fifth century was adorned with many matchless sculptures and buildings. But in and between them stood countless *stelae* with inscriptions, a store house and a tumble-down temple, several unfinished buildings, and a number of fenced enclosures and altars. Its effect must have been not unlike that of a modern graveyard or of the interior of a museum of antiquities. On the other hand the citadel of Pergamon was laid out according to a well considered plan and so were the pleasure grounds of Daphne and the royal quarters in Alexandria. This was certainly an advance.

Nor is the assertion true that literature was no longer creative. To say nothing of the New Comedy, which the Romans preferred to the Old, the Hellenistic period created two new types which had a mighty influence on all succeeding ages. Theocritus has long since been given his honorable place as the inventor and greatest master of idyllic poetry. But it is only recently that new papyri have shown us that contemporaries of Theocritus were the creators

of the novel. The two types belong together. Romanticism and feeling for the beauty of natural objects are characteristic of both—the one a result of life in large cities and its lack of country charms, the other the result of a higher and more worthy estimation of woman. It can hardly be viewed as a mark of decadence that the third century records the names of women who were not courtesans, whatever we may think of the rôle played in politics by ladies of the royal families. Fiction, moreover, found a rich material in the tales of strange adventures brought back from the far East which had been newly opened to the Greeks as a kind of wonderland. The Odyssey had, in accordance with the fashion of its age, expressed in verse the stories of the first bold mariners who sailed the western Mediterranean, just as Shakspere's Tempest was composed in the atmosphere of the marvellous which the returning explorers from America had created. The prose novel of the Hellenistic period was the offspring of similar conditions.

Both Curtius and Grote have much to say of a decline in morality in the latter part of the fourth century. This would be serious if true. Droysen thinks it a fact, and throws into lurid light the degenerate morals of Greek society at the turn of the fourth and third centuries. He cites as his authority the New Comedy. This certainly reveals a looseness of family life, if modern standards be applied; but the same, or worse, is true for the comedy of Aristophanes. Comedy always exaggerates, and the plain speaking of Greek comedy proves immodesty, or lack of refined feeling, not immorality. Much is so explained, but much still remains to be explained; and it cannot be doubted that infidelity to the marriage vows was one of the weak points of Greek society, as of every society where slaves exist. That the third century was worse than the fifth, or that it was as bad, is in itself doubtful, and refuted by the evidence. At any rate, the relations of the sexes were not such as to lead to a decrease in population; indeed, until Alexander gave to the Greeks elbow-room, the

problem facing political theorists was the *over*-population of the country. The stream of emigration into Asia which followed its conquest did not cease at Alexander's death, and remedied a great economic evil. For the same causes which had produced the early colonization of the Mediterranean fringe were again operative. And this time another evil was joined to over-population. The influx of slaves was pushing the free workman to the wall, and large estates, worked by slave labor, were everywhere replacing small holdings. Slaves were the machinery of antiquity and working as they did, without wages, became its curse. It was the institution of slavery that made manual labor degrading for free men, turned the best intellects from those technical sciences which have invented gunpowder and the means of defense against brute strength, and converted the small farmers either into city mobs which made livings by selling their votes, or into professional soldiers whose devotion was given to their general and not to their state. Although slavery still continued its evil work and ultimately destroyed the culture of antiquity, Alexander opened up a new world to the landless Greeks, and so relieved the pressure without degrading the men. And in this way there were set to new and honorable tasks both the mental alertness of the Greek people, which showed itself at the time of the apostle Paul in a desire "to tell or hear some new thing," and the nervous restlessness of the city states, which Plato compares to that of a fever-stricken patient who turns now to one side and now to another in the hope of bettering his condition. Hardy settlers made new homes for themselves on the shores of the Caspian Sea, by the Jaxartes river, and at the foot of the Himalayas. These at any rate can hardly be said to have lacked the virile qualities of their ancestors who fought at Marathon. As well call the age of Drake and Raleigh degenerate because Shakspere wrote loose comedies! It was not because Athens and Sparta produced sons less capable than those of the fifth century that Macedonia came to the front.

War had become a task for professionals. Iphicrates, Epaminondas, and Philip made war machines out of trained soldiers with whom the citizen levies could not cope. Furthermore, the genius of Philip must be put into the scale, and the resources of a large state at his free disposal. Macedon was naturally stronger than the city states of Greece individually, and union among them was impossible. The sternness of the conflict of 338—the odds being as they were—shows that old Greece was as vigorous as ever. Its moral fibre was still sound, else the Stoa and the Garden had not arisen and become popular at just this time. The doctrines of Zeno and Epicurus replaced the Homeric religion for educated men who had lowered the old gods to the level of kings rather than joined the masses in elevating their sovereigns to Olympus. The deification of a foreign potentate was not a mark of subserviency, but an expression of international courtesy; and the convenient doctrine of Euhemerus that Zeus and the other gods were but kings deified because of their services to mankind, gave to a Ptolemy or an Antiochus an easy ascent to godhood, and won for him reverence and loyalty from subjects whose devotion was not secured by any principle of hereditary succession. In this way the Caesar-worship of the third century is to be understood. The masses were superstitious as they always had been; there was vice in big cities then as now, and instances of corruption and effeminacy in high society are not confined to the present advanced age. But the main body of the Greek nation was sound in the third century—not in Macedon alone, but in old Greece too; it was humane, as in the fifth century it had never been; it had the proud consciousness that the whole world was at its feet; it was not inferior to its past in literature, art, and love of freedom, and in two points it was distinctly superior,—in politics and in science.

Politics had been a science in old Greece which had occupied the minds of its greatest thinkers. At Athens there had been elaborated an instrument of government

wonderful in its delicacy and perfection. But it was meant for Athens only and could not expand; no Athenian dreamed of extending its privileges to non-citizens; it was too much a government by the people to admit of a strong executive; and the like was true in other cities. It remained for the third century to prove that a union of city states was possible which should avoid the weakness of an amphictyony and the arbitrary domination of an hegemony. The third century created federal institutions, created a united whole out of autonomous members, with a strong head invested with constitutional authority—a creation of unparalleled magnitude in European history. Had it come at the time of the Persian wars, who can imagine the course Greek history would have taken? Coming when it did, it served but to aid the long wars of the Hellenistic monarchs in producing a balance of power in the Greek world like to that which preceded Chaeronea. In the fourth century it was Macedon which destroyed the equilibrium; in the second it was Rome. Fourth century Greece, which could muster 200,000 foot, was conquered by less than 30,000 Macedonians, and Hellenistic Greece, which could put infinitely more troops in the field, was subdued by less than 50,000 Romans. Rome was a strong power, but the Greek people, if united, was incomparably stronger. The Aetolians were in truth not far wrong when they claimed credit for beating Philip at Cynoscephalae. The friction between the city states of classic Greece, and between the kingdoms and leagues of the Macedonian era, undoubtedly called forth the best energies of the Greek people, furthered the clash of ideas from which truth issues, prevented the intolerance of religious uniformity, and made impossible the dead level of thought which characterized the Roman peace, but it was not an unmixed blessing. It made Greece powerless to strike or to defend.

And the third century was superior to the past in science also. The Hellenes did many great things in the course of their eventful history, says Beloch, but "the greatest thing

they accomplished, that which assures them for all time the foremost place among the nations which have influenced the destiny of the human race, is that they were the first to free mankind from the bonds of superstition,—they were the founders of science. And it is precisely in the time between Alexander and the Roman conquest that Greek science reached the height of its development,—a height to which human knowledge did not again attain till seventeen or eighteen hundred years had passed." In proof of this statement it is sufficient to mention the names of Aristarchus of Samos, Euclid of Alexandria, and Archimedes of Syracuse. Aristarchus forestalled Copernicus in proving that the sun is the center of this planetary system and that the earth turns on its own axis. The fifth century had believed the earth flat and motionless and the sun a fiery mass 'perhaps as big as the Peloponnese.' Euclid wrote the most remarkable mathematical book that has ever been written—a book, which, translated into as many languages as the Bible, is everywhere used to-day; and Archimedes was in theoretical science a man of Newton's class, although his application of science to practical purposes has won for him his popular reputation.

Philology, too, is a creation of the third century, and it is rather unkind of the science that for a long time it showed so little appreciation for the age of its birth. Latterly it has changed its tone, and perhaps it may come as a surprise to some to learn what modern historians and philologians think of this century. Professor Beloch of Rome, known as one of the most brilliant of recent Greek historians, says: "What Italy was in the fifteenth century, that, but in a still higher degree, the Greek countries were in the third century before our era. For at that time there existed outside of the Greek world nothing whatsoever except barbarian and semi-barbarian lands. And the Greek people stood at the summit of its development." And again: "The Greek people of the third century was ethically and intellectually at least the match of its

forefathers of the classical time, and in addition it had the consciousness that the world was mentally and politically subordinated to itself." Benedictus Niese, who has first treated the Hellenistic age as a whole in his great work on the Grecian and Macedonian states, has something similar to say: "It must not be imagined that Greece was at this time defenseless, resourceless, or ruined. To be sure, the states earlier powerful—Sparta, Athens, and Thebes—had fallen from their heights and the time of their greatness was past. But others had risen in their stead, and when one looks over the country as a whole one can speak quite as well of advance as of decline. Greece was a blooming *herrliches* land, its plains well-planted with all kinds of grains and fruit-trees, its mountains clad with forests, and its pastures rich with flocks. In spite of the great emigration it was thickly populated. . . . In comparison with the past much was lost. Outside in the Orient a new Hellas came into being which took with it a good part of the nation's energy. But there were gains too—a broadened point of view and a finer humanity. Greece was a fountain of spiritual and material force, a possession of priceless value." The view of Adolf Holm is too well known to need quotation; he has been one of the foremost champions of the Hellenistic age.

There was, then, a steady advance in ethics, morality, humanity, science, politics, and economic and social conditions from the fifth century to the second; new fields for literature and art were being continually opened up and new types created; civilization and knowledge were being widely diffused. If the chief progress of the human race from the fifth century B.C. to the present time has been the extension of culture from a comparatively small group of city-states to half a world of men and women,—then the age of Alexander and his successors witnessed one of the most important steps in that development. If that progress has consisted in the advance of science, in man's control over nature, and his knowledge of his relation to the universe

and to the world of plants and animals,—then the same importance attaches to the third and second centuries B.C.

Such was the Greek people when Rome destroyed the equilibrium and conquered the eastern states one after another. Rome was no gentle conqueror. The atrocities of a Roman victory had been already experienced by Greeks in Italy and Sicily, and many a prosperous city went to the ground in the course of the Punic wars never to rise again. Diplomatic reasons often curbed the Roman armies, so long as the policy of fighting Greeks with Greeks was followed. But nevertheless the history of Rome's progress in the east is but one long succession of tales of cities burned and citizens massacred or sold into slavery. No less than Polybius, a friend of Rome, is our authority for the statement that Roman armies, when they stormed a town, often spared no living thing. In the lust for slaughter men, women, children, and even animals were hewn down by the brutalized soldiery. The fate of Corinth is known to all. And the conquest was not the worst, bad though it was. The Pascha-rule of the Roman proconsul was still worse. It is an old saying that a provincial administrator under the republican *régime* made of the booty he exacted from his province three parts, one to pay his election expenses, one to enable him to spend the rest of his days in luxurious living, and a third to bribe the jury when tried for extortion. From 146 to 88 B.C., Greece lay prostrate and helpless. Apparently all was well. "But," says Beloch, "as soon as the first opportunity for liberty offered itself, in the Mithridatic wars, a terrible outburst of Hellenic national feeling followed. The dangers which lay slumbering under the calm surface were revealed. Roman power in the east fell together like a house of cards. But it was now too late. The long foreign domination had done its work. The Greek nation no longer possessed the moral force to maintain the independence it had regained. The heroic contest of Athens remained fruitless, but it cast like a blood-red sunset sky a transfiguring glimmer upon the

setting of the nation. Now Greece was suddenly dead. It never renewed the attempt to oppose the foreign rule."

It was not economically alone that Greece suffered under its Italian mistress. Intellectually it went down step by step as Rome advanced. Rome, it is true, assimilated Hellenic culture, but the process of assimilation lowered the standard; for Rome was not Hellas. But it was in the character of its people that Greece most of all deteriorated, and that was fatal. The provincial system of the republic ruined the moral fibre of not Rome alone; it ruined that of the provinces also. Cowed by the domineering lordship of a rapacious governor and his equally rapacious staff, deprived of all hope of justice through the corruption of the Roman jury courts, crushed in trade by the unequal competition of the Roman knights, scoffed at and despised even because of his higher culture, the Greek soon proved the truth of the Homeric saying that the day of slavery takes from a man the half of his virtue. In the third century the doctrine of Aristotle that the Greeks were a chosen people, set apart to rule and to instruct the world, found general acceptance, and was true. In the first century they were called *Graeculi*, and deserved the title.

THE HAWAIIAN TERRITORIAL ACT.*

By Arthur C. Alexander.

Congress at its last session enacted laws for the government of Hawaii and also of Porto Rico. These laws have already been in operation for some months. It is the purpose of this paper to discuss briefly the features of the Hawaiian Territorial Act and to show somewhat how these have been made to conform to American ideas and precedents.

I cannot claim to be an expert in either law or political science, and at the outset I shall have to ask the forbearance of those present who have the right to be called such experts. However, I was born and brought up at the Islands. I am familiar with their history, and with the conditions prevailing there, and I trust I can at least discuss them intelligently, if not with the skill and authority of an expert.

The problem of extending the government of the United States to the Hawaiian Islands with as little disturbance as possible was very much simpler than that presented in the case of Porto Rico. The population of the Hawaiian Islands was in a great measure American,—American at least in ideas and aims, if not in nationality,—the laws and customs of the country were American in that they were thoroughly Anglo-Saxon, the form of government at the time of annexation was that of a republic controlled by men of American sympathies, and the people for some

* Read before the Outlook Club of Oakland, January 24, 1901.

years had been expecting and preparing to become an integral part of the United States. The republican government in existence at the time of annexation was the product of years of experience,—some of it very bitter experience too. Every provision of its constitution had been the subject of long and careful study by the wisest and best men of the community, and it had been adopted only after full and free discussion by all. I very much doubt if a better system of government could have been devised,—*i.e.*, better suited to the peculiar conditions at the Islands,—and I doubt also if the Islands will ever be as well governed again as they were under the "Republic of Hawaii." The act of Congress establishing the Territory of Hawaii, as we shall see, was based in a great measure on the constitution and laws of this republic.

The joint resolution of Congress by which the Islands were annexed directed the President to appoint "five commissioners, at least two of whom should be residents of the Hawaiian Islands, who shall, as soon as reasonably practicable, recommend to Congress such legislation concerning the Hawaiian Islands as they shall deem necessary and proper." The President in his choice of commissioners showed his appreciation of the importance of the task before them. The American members of the commission, Senators Cullom and Morgan, and Representative Hitt, were men of unquestioned ability and experience, and men who had taken an active interest in the annexation of the Islands,—one of them, Senator Morgan, had previously visited the Islands and devoted much time to a study of the social and political conditions there,—and the Hawaiian members, President Dole and Judge Frear, were not only men of ability, but also men who were thoroughly conversant with affairs at the Islands and vitally interested in the establishment of good government there. This commission met at Honolulu, August 18, 1898, six days after the formal transfer of sovereignty, and devoted themselves with energy and industry to the formulation of the new system of

government. The problem before them was in brief to devise a system of government that should conform closely to established American standards and at the same time retain those features of the previous system which had been found to be especially adapted to local conditions. As might be inferred from the personnel of the commission, their work was thoroughly and conscientiously done. Their report was transmitted to Congress on December 8, 1898, and recommended the passage of three bills, which they had prepared, *viz:* "A bill to provide a government for the Territory of Hawaii," "A bill relating to Hawaiian silver coinage and silver certificates," and "A bill relating to postal savings banks in Hawaii." The work of the commission was practically embodied in the first of these bills, which provided a complete territorial form of government for the Islands.

Owing to the press of other important business before Congress, this bill failed of immediate consideration. In the Senate it was referred to the Committee on Foreign Affairs, was reported back with amendments, considered in the Committee of the Whole, ordered printed, and finally passed with more amendments in March, 1900. In the House of Representatives its history was somewhat similar, it having been referred to the Committee on Territories, reported back, considered by the Committee of the Whole, printed, and passed with amendments about the same time that it passed the Senate. The bill as passed by the Senate differed in many important particulars from that passed by the House, which necessitated further change. A committee for conference was appointed composed of able men who were familiar with the provisions of the bill. The two bills were brought into agreement by them, and, at the same time, were divested of several harmful and useless amendments. The bill in its final form under the title "An Act to provide a government for the Territory of Hawaii" was passed by both houses of Congress on Friday, April 27, 1900, and went into effect forty-five days later, on June 14, 1900.

I have not attempted to follow in detail the weary struggle to get the bill through Congress and the history of the many amendments that it underwent at various times. In its final form the territorial act contained the most essential features of the bill drafted by the commission and granted the new territory some rights and privileges not accorded to the older territories.

That Hawaii should be given a territorial form of government was assumed almost as a matter of course. It hinged on whether the inhabitants were qualified to exercise the suffrage and assume the responsibilities of a republican form of government. Judged by their previous history, they were evidently qualified for such responsibilities.

"The constitution and . . . all laws of the United States, which are not locally inapplicable," were with two exceptions extended to the new territory. These exceptions were: first, a federal statute containing a provision requiring all the laws, with certain exceptions, passed by any Territorial Legislature to be submitted to Congress for approval or disapproval. "This provision," to quote the report of the Committee on Territories, "states no time in which such disapproval may be made, and a law may thus be disapproved long after it shall have gone into effect, and long after important rights of property may have been affected by it, and in virtually repealing the section, so far as Hawaii is concerned, no power is taken from Congress to repeal or change the laws passed by any Territorial Legislature." Secondly, a statute which provides that "no corporation or association for religious or charitable purposes shall acquire or hold real estate in any territory during the existence of the territorial government of a greater value than fifty thousand dollars." This statute would have done injury to certain large estates which are held in trust for charitable purposes, for the education of Hawaiian youth, and for the care of the sick and aged. It would also have affected the local branch of the Young Mens' Christian Association, which has property in excess of $50,000.

The constitution of the Republic of Hawaii and some seventy-three laws, which were specified by name, were repealed, and all other "laws of Hawaii not inconsistent with the constitution of the United States" and the territorial act were continued in force. The laws thus repealed were in general statutes that conflicted with existing statutes of the federal government or were made inoperative by the provisions of the territorial act.

In order further to insure the continuity of government it was provided that all legal actions and processes, and all contracts, when not inconsistent with the territorial act, should continue in effect, with one notable exception,—contracts for personal labor or service. All such contracts made since the transfer of sovereignty on August 12, 1898, were specifically declared null and void, and all labor contracts previous to that date were practically nullified by prohibiting any suit for their enforcement other than a civil suit for breach of contract. This provision was inserted by the committees in charge of the territorial bill to meet the demands of the labor unions and also to satisfy a national prejudice against anything resembling slavery in any form.

The successful carrying on of the sugar industry at the Islands has hitherto depended largely on the employment of great numbers of cheap contract laborers. As this is the chief industry of the Islands, the effect of this provision on their material prosperity will undoubtedly be great. At the same time the material loss to the Islands will be more than offset by the gain in those elements which make for Christian civilization and freedom. The future government of the territory will depend for its very life on the development of an intelligent and responsible class of citizens,—a class of citizens that can never be developed out of cheap contract laborers.

That the labor-contract system would be abolished was regarded as inevitable, and the action of Congress was in part anticipated by the sugar planters. While the bill was pending thousands of Japanese laborers were imported and

an effort was made to bring in an equal number of more desirable Portuguese laborers, which was unfortunately frustrated by the American consul at the Azores. The supply of plantation laborers is still inadequate. This gives them an advantage which they have not been slow to appreciate. Wages have been raised on all the plantations, but there is still much restlessness among the men, particularly the Japanese, and the labor situation at best is far from satisfactory.

All persons who were citizens of Hawaii when the formal transfer of sovereignty took place on August 12, 1898, and all citizens of the United States resident in the Islands at that time were made citizens of the new territory. It was also provided that aliens who had resided in the Islands for five years previous to the taking effect of the territorial act might be naturalized and become citizens without being required to make a previous declaration of intention; previous residence within the Islands being considered as if it had been within the United States. This provision offered an opportunity to many foreign residents to become citizens who had not cared to renounce their previous citizenship for that of the Island republic.

The territorial act provides for a Legislature consisting of two houses,— a "Senate" of fifteen members, and a "House of Representatives" of thirty members. Senators shall hold office for four years and Representatives for two years. Under the Republic of Hawaii the lower house had but fifteen members, and a property qualification was required of members of either house. This was thought necessary to prevent in a measure the election of corrupt and irresponsible men, as had frequently happened under the monarchy. The framers of the territorial act apparently deemed it un-American to require of the representatives of the people property qualifications not required of those who elected them.

The Legislature's power is made to include "all rightful subjects of legislation not inconsistent with the constitution

and laws of the United States locally applicable." It is prohibited, however, from granting "any special privilege, immunity, or franchise without the approval of Congress," but "it may by general act permit" the formation of corporations for certain industrial and commercial purposes, which are carefully specified. The Legislature is given power to create counties and city and town municipalities. The power to issue bonds or incur indebtedness is only permitted for certain stated objects, and such bonds cannot be issued until approved by the President. The amount of indebtedness that can be incurred in a single year is limited to one per cent. of the assessed value of all taxable property, and the total indebtedness is limited to seven per cent. for the whole territory and three per cent. for any subdivision of the territory. Any bonds issued must be made redeemable in five years and payable in fifteen years.

The provisions for the organization of the Legislature and its conduct follow closely those for similar bodies in this country, with perhaps two exceptions taken from the constitution of the Hawaiian Republic. Speaker Reed's famous ruling in regard to a quorum was incorporated in that constitution and is retained in Section 24 of the territorial act as follows: "for purposes of ascertaining whether there is a quorum present, the chairman shall count the number of members present." The other exception is the power given the Governor to veto any specific item in any bill appropriating money,—a privilege that the President himself does not enjoy. Neither house can adjourn for more than three days without the consent of the other and a session is limited to sixty working days, which may be extended not more than thirty days by the Governor.

By the territorial act the suffrage is extended to all male citizens, who have resided in the country one year, are twenty-one years old or over, and are "able to speak, read, and write the English or Hawaiian language. Under the Republic of Hawaii the voter for Senator was required

to be in receipt of an income of at least $600 per annum, or possess at least $1500 in real estate or $3000 in personal property. A similar requirement was inserted in the bill prepared by the commissioners, but was struck out in the House Committee on Territories because of the opposition to any such restriction of the franchise.

That Congress made a grave mistake in not restricting the franchise is practically the unanimous opinion of the best and most thoughtful men in the Islands. Their experience of free suffrage under the monarchy was a bitter one, and they fear that the corruption and misgovernment of that period may be repeated. That their fears are justified is amply shown by the results of the first territorial election. With unrestricted suffrage the political future of the Islands certainly does not look bright. The natives are not a vicious class; they are not an illiterate class; to a certain extent they are a comparatively intelligent class; but in matters of judgment they are mere children and will be for years to come. Unscrupulous politicians have stirred up among them a distrust of foreigners and have made use of this distrust to secure their votes for the most corrupt men and for the most unwise and vicious measures. This has been done over and over again to the disgust of right-minded men and with great detriment to good and stable government.

Are our requirements for the suffrage all that they should be, and, if they are not, in what way should they be modified? These questions are going to be answered very definitely before we get through legislating for our new dependencies. It is fear of radical changes in these requirements that has produced so many rabid anti-expansionists. But if the mere ability to read and write is not a sufficiently searching test of a man's fitness to vote, is it not time that we found something better? In the case of the Territory of Hawaii the possession of, or abilitity to acquire, property would undoubtedly be a better test. I am not prepared to defend the wisdom or justice of so undemocratic a restriction,

but that it would be conducive to good government in Hawaii there is no question. Even if it tended to place the the control of the government in the hands of the moneyed class, it would be but the lesser of the two evils. A strong but selfish government would be preferable to a weak and corrupt one.

The secret ballot system in use under the Republic, with some modifications, has been retained, the cumulative method of voting, which was a feature of that system, being abolished.

The executive power of the territory is vested in a Governor appointed by the President for a term of four years, "unless sooner removed by the President."

The lack of telegraphic connection between Washington and Honolulu renders it necessary that the governor should be authorized to act for the President in certain contingencies. So, in addition to the usual duties and powers of such an executive, the Governor is given power to grant "reprieves for offenses against the laws of the United States" and "whenever it becomes necessary he may call upon the commanders of the military and naval forces of the United States in the Territory of Hawaii, . . . and he may, in case of rebellion or invasion, or imminent danger thereof, when the public safety requires it, suspend the privilege of the writ of *habeas corpus*, or place the Territory, or any part thereof, under martial law," with this proviso, *viz:* "until communication can be had with the President and his decision thereon known."

The Governor and all other officers whose appointment is provided for by the territorial act must be citizens of the territory—a provision that ought to have been inserted in the laws governing the older territories.

A Secretary of the Territory is provided, who shall be appointed by the President and hold office for four years. In case of the disability or absence of the Governor the Secretary is made acting Governor.

The following executive officers are to be appointed by

the governor: an attorney-general, a treasurer, a commissioner of agriculture and forestry, a superintendent of public works, a superintendent of public instruction, an auditor, a deputy auditor, a surveyor, and a high sheriff. The duties of these officials are sufficiently indicated by their titles.

In the organization of the judiciary the framers of the territorial act met the conditions due to the isolated situation of the Islands by a system resembling more that of a state than that of a territory. The courts of the older territories, as I understand it, have both federal and territorial jurisdiction and their decisions are subject to appeal to the United States Supreme Court. Owing to the volume and importance of the Island commerce and their position on the highways of the Pacific, it was deemed best that there should be a separate federal court to try the admiralty cases that are sure to arise, "which," to quote the commissioners, "may be of international importance." The Hawaiian Islands were therefore constituted a federal judicial district, with a United States District Judge, with a district attorney and a marshal, all of them appointed by the President for a term of six years. This federal court was granted "in addition to the ordinary jurisdiction of district courts of the United States, jurisdiction of all cases cognizable in a Circuit Court of the United States." The difficulty of carrying cases to Washington on appeal made it necessary also that the jurisdiction of the local territorial courts should be final and not subject to appeal as in the case of the other territories.

There had been developed at the Islands an excellent judicial system resembling closely that of one of our states. The independence and integrity of the judiciary had been the one bright spot in the history of the later monarchy, and a strong feeling existed against anything tending to undermine it. This and other considerations led to the practical continuance by the territorial act of the judicial system already established, the only changes made being in

the tenure of office and the method of appointment. There are district or police courts, superior courts of record called "circuit courts," and a supreme court of three members. With the exception of the first, which are left for the Territorial Legislature to establish, the judges of all the courts are appointed by the President for the term of four years, and are thus rendered independent of the territorial government. In the original bill prepared by the commission the judges of the supreme court and of the circuit courts were to be appointed by the Governor, and could only be removed by impeachment proceedings before the Territorial Legislature. The members of the supreme court were to hold office "during good behavior" and the circuit judges for a term of six years, following closely the constitution of the Republic of Hawaii. The granting to the Governor of so great power of appointment was strongly opposed as well as the life tenure for the justices of the supreme court, and the method of appointment and tenure of office were both changed while the bill was yet in the committee stage.

"The laws of Hawaii relative to the judicial department . . . except as amended by the territorial act, are continued in force;" the provisions relating to foreign, native, and mixed juries being repealed. All the court proceedings and records as well as those of the legislature are to be in the English language, instead of in both English and Hawaiian as heretofore.

An innovation to the Island courts was the introduction of the grand jury system, which necessarily followed the extension of the United States constitution to the islands.

The territorial act prohibits the local courts from granting a divorce to anyone who has resided in the territory less than two years. This will effectually prevent Honolulu from becoming another Sioux City.

The peculiar land system and land laws already in existence were perpetuated by the territorial act, despite efforts made by certain parties to have them changed. No one familiar with the facts will dispute the wisdom of this

action. The physical features of the Islands and the history of land titles there were such as to preclude any such subdivision of the public land as exists here. The Hawaiian land laws had been developed and adapted to the local conditions by men of more than ordinary ability who had made a life study of the subject. They had stood the test of trial, and under the circumstances it would have been folly to have attempted to extend to the Islands any modification of our own general land laws.

In the joint resolution of annexation it was provided that the revenues from the public lands "shall be used solely for the benefit of the inhabitants of the Hawaiian Islands for educational and other public purposes." The territorial government has therefore not only the control and disposal of the Hawaiian public lands, subject to future legislation by Congress, but has also the sole use of the income from these lands. This notable concession was thought necessary to provide sufficient revenue for the maintenance of the territorial government.

In the disposal of its public lands the Territory of Hawaii was restricted in one particular, *viz.*, that "no lease of agricultural land shall be granted . . . for a longer period than five years." A provision inserted in the territorial act just before its final passage also provides that no corporation shall hold more than one thousand acres of real estate, existing vested rights being excepted. This, as is evident, is intended to prevent the productive land from ever being monopolized by a few great corporations.

The territorial act provides for the election of a Delegate to Congress and constitutes the Islands a district of the United States for the collection of internal revenue and custom duties.

In ancient times the land was so divided that each chief would own a bit of mountain land, a bit of open land, and a bit of fishing ground. This was accomplished by dividing each island roughly into narrow sections running from the mountain top to the seashore, each section usually carrying with it the exclusive right of fishing off the shore.

These fishing rights are still in existence, and in many cases are sources of great profit to their owners. In the territorial act provision is made for the throwing open of all fisheries to the public and for the compensation of the owners of all private fisheries.

Provision is also made in the act for the transfer of the local postal department to the United States; for the retention of all public property by the territorial government; for the establishment of federal quarantine stations at the Islands; for the granting of American registers to vessels registered under the Hawaiian flag prior to August 12th, 1898; for closing up the accounts of the Hawaiian Postal Savings Bank; and for the extension of our Chinese Exclusion Act to the Islands.

In connection with the last provision, it was provided that "no Chinese laborer . . . shall be allowed to enter any state, territory, or district of the United States from the Hawaiian Islands." This restriction was inserted in the bill just before its final passage and is purely and simply a bid for the labor vote of the Pacific Coast. At the Islands there is abundant employment for the Chinese laborers at good wages and with comparatively good treatment. It is hardly reasonable to suppose that they would willingly leave a life of so much freedom for one here where they would be subject to much ill-treatment.

In conclusion, a word as to the services rendered by the framers of the Hawaiian Territorial Act. The act itself bears witness in every line to their ability and the thoroughness with which their work was done. If it contains any catch-vote provisions, its framers are free of all responsibility for their insertion. They sought solely to provide for the Islands the most suitable system of government possible under our constitution, and they did not allow themselves to be diverted by any questions of expediency or policy. It is no small thing that the problem of legislating for our new dependencies has been begun with such an honest effort to give one of them the very best government within our power.

THE COLOR-PRINTS OF OLD JAPAN.*

By Wm. Dallam Armes.

"What are they?" is a question often asked by those looking for the first time at a collection of Japanese prints. To say that they are chromoxylographs, is to give an answer strictly accurate. But as this is more concise than simple, it may be well to say in non-technical, popular language that they are prints in colors from engraved wooden blocks, as many blocks and impressions ordinarily being required as there are colors.

In Europe towards the end of the eighteenth century similar prints were produced, but as their reception by the public was not such as to encourage their makers, there was no development of the art comparable with that in Japan in the same century.

The Japanese name for these prints in general is *nishiki-ye*, but separate names distinguish the three principal kinds: the long narrow prints are termed *hachirakaki;* the large "broadsides" are *ichimai-ye;* and the smaller, more nearly square prints are *surimono*. Usually each broadside is an independent picture; but often two or three, and sometimes five, six, seven, or nine *ichimai-ye* must be united to get the whole design.

* A lecture accompanying an exhibition of prints held at Stiles Hall under the auspices of the Art Association of the University of California, February 7, 1901. (The lecture has been expanded somewhat and quotations and foot-notes freely inserted for the guidance of those wishing to read further on the subject.)

These prints were usually the result of the combination of the talents of three individuals; the painter, the engraver, and the printer generally being different persons. The painter drew the design in outline on a sheet of thin, semi-transparent paper, that was pasted face downwards on a slab of wood, usually cherry, cut with the grain, not across it, as are the blocks used by our wood-engravers. Having oiled the paper so that every brush-mark was plainly visible, the engraver carefully cut around the lines of the design with a sharp knife held in the right hand and guided by the left, and with small chisels removed the superfluous wood. After this outline-block had been washed to remove all paper, as many proofs were taken from it as there were to be colors in the finished picture, and on these the artist indicated his color-scheme. Each of these proofs was pasted on a block and a cut for each color made as before. In precisely the same places at the bottom of each were cut a right-angle and a short horizontal line to guide the printer in securing register.

The pigment was applied dry and was mixed and adjusted on the block with a broad, flat brush loaded with rice-paste. A dampened sheet of a tough, fibrous paper, made from the inner bark of the mulberry and admirably adapted for producing the most delicate effects, was then placed on the block, and the ink transferred to it by pressure with the *baren*, a flat disc of twisted paper rolled spirally and covered with a piece of the dried sheath of a bamboo sprout. Sometimes the ink was partially wiped from the block with a cloth or brush or the ball of the thumb, as is done by our printers of etchings, and what is termed a "gradation print" produced.

Ordinarily, as has been said, as many blocks and impressions are required as there are colors, and in some modern work, as the Kokkwa, the great art-work in which Mr. Ogawa of Tokyo is reproducing masterpieces of the various schools of Japanese art, the finished picture is said to be the result in some cases of no less than ninety

printings.* But in the old work new shades and tints were often produced by superimposing two or more colors, and Dr. Anderson states that "the effect of printing from two or more blocks was obtained in some cases by preparing a single block with ink of different colors."† Sometimes a deeply incised, uninked block was used to emboss certain parts of the design; waves, foliage, the patterns of cloths, and the folds of *kimonos* being thus treated. This is not as common in the *ichimai-ye* as in the *surimono*. These small prints were usually printed with greater care on a finer quality of paper, and were frequently given added richness by the use of gold, silver, and bronze powders, powdered mother-of-pearl, and flakes of gold leaf.

The method of printing seems to us slow and crude, but the results leave little to be desired. The impression is much more thoroughly under the control of the printer than in even the best of our machine-presses, and seldom is there a fault in the register. Much of the success of the finished picture depended on the care taken by the printer, and prints from the same blocks vary quite decidedly in value. The method of applying the ink to the block accounts for the fact that it is almost impossible to find two prints from the best period that are precisely alike: sometimes there is but a slight difference in the colors, sometimes the whole color-scheme is different.

Gradation-printing came into use comparatively late and is to be found mainly in the landscapes of Hiroshige and his imitators. A cheap, late print representing a huge fire burning in the foreground of a snow-clad landscape, is in this respect noteworthy. The column of smoke from the fire extends across three-quarters of the picture, and the gradual loss of density of the smoke as it rises is admirably represented: the red of the flames shades off into the gray smoke, so dense that the ridge of snow just back of the fire cannot be seen through it; the whiteness of the next

*Hill-Burton, M. R.: Photography and Color-Printing in Japan. International Studio, 5:250.

†Anderson, Wm.: Japanese Wood Engravings. London, 1895, p. 64.

ridge can faintly be perceived; the next is quite apparent, as is the distant cone of Fuji; the red glow of the sunset sky is also seen through the dark gray; and near the top of the picture the gradually deepening blue of the sky is visible through the gradually lightening gray of the smoke. Whatever may be its shortcomings otherwise, as a specimen of gradation-printing, the picture is a great success.

These color-prints first became known to Europeans generally in 1862. In the Japanese section of the International Exposition held in London that year, Sir Rutherford Alcock exhibited a small collection of rather late examples that attracted considerable attention. Mr. John Leighton made it the subject of a lecture at the Royal Institution that he later printed as a pamphlet and illustrated with a reproduction of a print by Kunisada. In the same year a number of artists resident in Paris—Stevens, Whistler, Diaz, Fortuny, Legros, *et al*—became interested in the prints and began to collect and study them. Naturally they had considerable influence on their work, Whistler in particular having in his early works almost as much in common with the masters of Ukioye as in his later he has with the great Spanish painter with whom he is so frequently associated. One of his "symphonies" is hardly more than a transcript of "The Balcony" of Kiyonaga, and in another he follows Toyokuni so closely that even the little red decorative label on which the Japanese artist placed his signature is reproduced. His "nocturnes" are Hiroshiges done in pastel or oils.

As interest in the prints increased there arose a desire to know the history of the artists who had produced them. The revolution of 1868 opened Japan to foreigners, and a number of educated, appreciative connoisseurs were attracted thither. These studied with more or less thoroughness the art of the country and on their return to their homes published works on the subject. Other connoisseurs without the advantage of residence in Japan, but with the aid of Japanese lovers of their country's art who

had become domiciled in Europe and with access to the large collections that had been formed by museums and by private collectors, added to the literature of the subject. The publications of Anderson, Strange, and Holmes in England, Gonse, Bing, de Goncourt, and many others in France, Gierke, Brinckmann, and von Seidlitz in Germany, Madsen in Denmark, and Jarves, Morse, and Fenollosa in America have made accessible a mass of information in regard to Japanese painting in general and the especial school now under consideration in particular.

It has been shown, as was to be expected, that there has been a gradual evolution of the art of printing in colors from wood-blocks, and, thanks mainly to the researches of Mr. Fenollosa, the various steps in this evolution are now accurately known. A brief resumé will contribute to the appreciation of the prints.

Japanese painting, like the other arts of Japan, its poetry, and its science, is of Chinese origin,* and came to the island kingdom by way of Corea in the Fifth Century, A.D. At about the same time Corean painters made known to the Japanese the Buddhist art that had arisen in northwestern India, apparently under late Greek influence. This had much in common with Byzantine art, being stiff, formal, and hieratic in character, and glorying in the lavish use of gold and rich, but somewhat sombre, colors. The Chinese school, on the other hand, produced mainly black and white work that in the swift, easy flow of its lines gave evidence of its calligraphic origin. "All Chinese and Japanese critics," says Mr. Theodore Wores, "assert that painting is but a species of writing."†

By the union of these two and the peculiarly Japanese idiosyncracies, Japanese painting was evolved, the various schools depending on the varying proportions in which the

* *Cf.* Anderson, Wm.: The Pictorial Arts of Japan. London, 1886.

Bing, S.: The Origin of Painting Gathered from History. Artistic Japan, Nos. 13 and 14.

† Wores, Theodore: An American Artist in Japan. Century Mag., 16:679.

ingredients were combined: the Tosa, for instance, has a preponderance of the Buddhist element; the Kano, of the Chinese; the Shijo and Ukioye, of the Japanese.

The Tosa and Kano schools were aristocratic, courtly—the first connected with the court of the Mikado at Kioto, the second with the court of the Tokugawa Shoguns at Yeddo, or as it is now called, Tokyo. About 1620 Iwasa Matahei, who had been a student of the Tosa, and later of Kano school, broke away from their formalism and traditions and painted in a freer, more vigorous, more realistic style. Moreover, instead of confining himself to subjects drawn from the courtly life, the history, and the aristocratic literature of Japan and China, Matahei painted the subjects that he saw in the every-day world about him. His example apparently was not immediately followed, but in the next century there arose a class of bourgeois artists who looked back to Matahei as their master, and to the school that was founded there was given the significant name Ukioye—Painting of the Floating (or Passing) World. This was, it must be remembered, distinctly the people's art; its artists were despised by those of the aristocratic schools, and to this day, when connoisseurs of all lands are singing the praises of the Ukioye school, the upper classes of Japan hold it somewhat in contempt. Mr. John La Farge, on his visit to Japan, found that in talking to artists of the Kano school, it was advisable to make no reference to the work of Hokusai, whom all European critics place among the world's master painters.*

Probably the fact that Matahei confined himself to painting, in part explains why his example was not at once imitated. To produce works that did not appeal to the class that could afford to buy and were necessarily too expensive for those to whom they did appeal, was to produce "art for art's sake" in a sense that, even in those days of uncommercial art, could not win many proselytes. Not till late in the seventeenth century did Matahei have a

*La Farge, John: An Artist's Letters from Japan. Century Mag., 24:427.

disciple. Then Hishigawa Moronobu followed his example in abandoning the wornout classical themes and finding his subjects in the commonplace, everyday life about him. To popularize his work he availed himself of the art of the wood-engraver, which had been introduced into Japan via Corea in the twelfth or thirteenth century and had theretofore been used mainly for the production of portraits of Buddhist saints whose woodenness was by no means confined to the block from which they were printed. Moronobu, however, produced books of pictures that mark the beginning of artistic wood-engraving in Japan. In these the common people, who could not afford original paintings, could indulge their taste for the artistic, and their popularity led Moronubu to issue many volumes. These, Dr. Anderson tells us, "include copies of famous pictures, drawings of landscapes and street scenes, illustrated stories, incidents of history, poetry, and in fact almost everything with which we are familiar in the works of later and better known men."* To add to the effect these black and white reproductions of sketches were sometimes "spotted" with color by hand.

Moronobu's success soon called forth imitators, and one of these, Okumura Masanobu, did not confine himself to the production of books, but issued independent pictures that could be hung on the wall like *kakemonos* or pasted on screens. These too were often hand-colored, but about 1743 there appeared prints from three blocks, one for the black outline, one for a pale rose tint, and one for a light green. Just who deserves the credit for this innovation is not certainly known—Mr. Fenollosa is inclined to credit it to Nishimura Shigenaga†—and is unimportant, for it was at once adopted by all the leading designers of the time. It seems strange to us that the possibilities of this new method were not at once grasped, but apparently fully fifteen years passed before a third color was added, and nearly twenty-

* Japanese Wood Engravings, p. 16.

† Fenollosa, Ernest F.: The Masters of Ukioye. New York, 1896, p. 23.

five before Suzuki Harunobu by the use of seven or eight blocks produced prints that were not merely "mosaics spotted on a white ground," but were pictures with atmosphere, background, and a more or less—generally less—correct perspective. It is for this reason that the Japanese usually term Harunobu the inventor of the *nishiki-ye*, though, as we have seen, he was merely the culmination of a century-long development.

Before a brief account of the principal schools, or "families," of the Ukioye is given, it may be well to explain a peculiarity in regard to the names by which the artists are known to us. These are never their family, but are merely their brush-names. Usually a painter's name indicates his relation to some preceding artist whose pupil he has been or whose work he strives to imitate. Often the first name indicates the school to which an artist belongs, while the second, by which he is generally known, is formed by a prefix or suffix to a part of the name of his special teacher. Thus a boy named Kumakichi was sent by his father to learn the art of color-printing from Utagawa Toyoharu and adopted the professional name of Utagawa *Toyo*kuni. He in turn had as a pupil *Kuni*sada, who was the teacher of *Sada*hide. Sometimes a master gave to a favorite pupil a name that he had himself abandoned, as Hokusai, about 1800, bestowed the name Shinsai on his pupil Hanji.* Sometimes after the death of a famous artist a successful pupil adopted his name, as in 1844, Toyokuni having been dead nineteen years, Kunisada issued a *surimono* announcing to his friends that thereafter he was to be known as Toyokuni. Toyokuni's son Naogiro also abandoned the name of Toyoshige that he had taken on becoming a student with his father, and adopted that of Toyokuni. As a more modern artist also complimented the great master of the Utagawa school in a similar manner, this brush-name appears on an immense number of prints that vary quite decidedly in artistic worth and commercial value.

*De Goncourt, Edmond: Hokousai. Paris, 1896, p. 329.

Another element of perplexity to the collector comes from the fact, already indicated, that the painters sometimes changed their brush-names. The artist usually known as Hokusai, a name that does not indicate his relation to any preceding painter, but that means simply "the northern studio," is the most striking example of this: during his long life as an artist he used many different names, among them Katsugawa Shunro, Mugura Shunro, Taito, Tokitaro, Kako, Tamekazu, Manji, Shinsai, and Man Rojin. Naturally when one name is used by so many painters and so many names by one painter there are a number of problems connected with the history of the art about which the best critics are decidedly at variance, and one cannot be known as a collector of prints without being frequently called on to answer the question, "Do you think there was one Hiroshige, two Hiroshiges, or three Hiroshiges?" To which the only answer that avoids an argument is, "I do."

The first school of importance in the history of the Ukioye is the Torii. It was founded by Torii Kiyonobu, who flourished from 1710 to 1730, and included in a direct line Kiyomasu, Kiyoharu, Kiyomitsu, Kiyotsune, Kiyomine, and Kiyonaga. Strongly influenced by it were the great artists Shigenaga, Harunobu, Shigemasa, Yeishi, and Utamaro.* The greatest of the Torii, and many think of the whole Ukioye school, was Kiyonaga, whom Mr. Fenollosa terms "the central and culminating figure, with ripest mastery over all the technical points of the art of color-designing for prints."† According to Mr. Strange,‡ he was the first of the Torii to illustrate subjects from domestic life, his predecessors having devoted themselves exclusively to theatrical scenes and portraits of actors; but the accuracy of this statement may fairly be questioned. In beauty of line and color, grace, delicacy, and tender feeling, he is at

* *Cf.* De Goncourt, Edmond: Outamaro. Paris, 1891.

† The Masters of Ukioye, p. 115.

‡ Japanese Illustration, p. 26.

least the equal of Yeishi and Utamaro, who are sometimes ranked above him, while his pictures are free from the mannerisms and exaggerations that too often lower the artistic value of their works.

The next school to rise into prominence was the Katsugawa. This was founded by Shunsui, who died in 1750, and includes among others Shunsho, some of whose illustrated volumes are considered by Gonse* the most beautiful that Japan has produced, Shunko, Shunman, Shuncho, Shunzan, and Shunki. But the most famous of the school is Shunro, or Hokusai; who, however, long before his death departed from the style and traditions of the Katsugawa and founded a school of his own.†

The last, and by far the most prolific of the three principal schools, is the Utagawa. This was founded by Utagawa Toyoharu late in the eighteenth century, and includes Toyokuni, Toyohiro, Kunisada, Kuniyoshi, Kunimasu, Kunimaru, and a dozen of others of the tribe of Kuni-, Hiroshige, Yoshitoshi, Yoshitora, Sadahide, Sadamasa, and scores of less important men. Founded after deterioration had set in, the Utagawa school contains no artist that Mr. Fenollosa considers of second rank even, and but three—Toyoharu, Toyokuni, and Hiroshige—that he includes among those of third rank.‡ Naturally, as it was the latest and most prolific school, prints by the Utagawa are very plentiful.

Two of the artists that have been named deserve, even in a summary account of the Ukioye, a few words of special consideration. They are Hokusai and Hiroshige.

To one unfamiliar with his work the expressions used by European critics in writing of Hokusai seem extravagant, if not ridiculous. But the more one knows of him the more one is inclined to agree with the enthusiasts who rank him among the world's greatest artists. Strikingly

* Gonse, Louis: Japanese Art. Translated by M. P. Nickerson. Chicago, n. d. [1891], p. 68.

† *Cf.* Holmes, C. J.: Hokusai. London, 1899.

‡ The Masters of Ukioye, p. 115.

original, wonderfully versatile, and amazingly productive, he influenced his country's art as no European artist has ever influenced his. In addition to producing a large number of *kakemonos*, *surimonos*, and broadsheets of great excellence, he illustrated over five hundred volumes—romances (some of them written by himself), poems, humorous works, books of travel, sketch-books, books of views, educational works, etc. Gonse estimates that the number of motives and compositions cut from his designs exceeds thirty thousand, and writes "There does not exist in the history of art another example of such versatility and industry."* He "was in the habit," Sir Rutherford Alcock tells us, "of going about the streets sketch-book in hand, and at all hours, transferring to its pages the figures, effects, and incidents passing before his eyes."† His work thus became "a complete picture of Japan, a veritable cyclopedia expressive and picturesque.* Mr. James Jackson Jarves speaks thus of his art: "It is supreme in its own ways and wholly free from inane types, wearisome conventionalities, and pettiness or shams of any sort; it goes directly to its point, scorning all subterfuge; sturdy, versatile, never repeating itself, every stroke or thought a distinct note in art, realistic or idealistic, as the motive demands, exhaustive of common and aristocratic life, spicing everything it touches with racy individuality, few, if any, artists of any country surpass Hoffskai in the faculty of making common things and little things tell more pleasurably to the fancy as artistic surprises and fresh interpretations of the ordinary phenomena of nature and society."‡

*Japanese Art, p. 267.

†Alcock, Sir Rutherford: Art and Art Industries in Japan. London, 1878, p. 135.

‡Jarves, James Jackson: A Glimpse of the Art of Japan. With Illustrations from Japanese Designs. New York, 1875. (The designs are reproductions of sketches by Hokusai. The book antedates by three years the account of the artist in the brief outline History of the Pictorial Art of Japan, contributed by Dr. Anderson to the Transactions of the Asiatic Society of Japan, for 1878, which in his Japanese Wood Engravings he terms "the first European account of Hokusai.")

Throughout his long life he was ever a student, never content with his achievements. This "noble discontent" is apparent in the prefaces of several of his volumes of sketches. The Hundred Views of Fuji was introduced with the words: "Since my sixth year I have felt the impulse to represent the form of things; by the age of fifty I had published numberless drawings; but I am displeased with all I have produced before the age of seventy. It is at seventy-three that I have begun to understand the form and the true nature of birds, of fishes, of plants, and so forth, consequently by the time I get to eighty, I shall have made much progress; at ninety, I shall get to the essence of things; at a hundred, I shall have most certainly come to a superior, undefinable position; and at the age of one hundred and ten, every point, every line, shall be alive. And I leave it to those who shall live as long as I have myself, to see if I have not kept my word. Written, at the age of seventy-five, by me, formerly known as Hokusai, but now known as Gakyo Rojin (The Old Man gone Mad for Painting.)"*

In the preface to his Saishiki-Tsu (Complete Account of Coloring), published when he was eighty-eight, he indicated the tentative nature of his instructions by stating "when I am ninety, I shall change the style of the art, and when I am a hundred, I shall work a revolution in all branches of the arts."†

His humor and his passion for his art appear in the cover-design that he made for an elementary book on coloring that he wrote for children; it represents him painting with a brush in his mouth, a brush in each hand, and a brush between the toes of each foot!

Hokusai did not attain the great age that he desired, but died at ninety in 1849. His last letter, written to an old

* Quoted by John La Farge. Century Mag., 24:427.

† Translated for me from the Ukioye Hennenshi (Chronological Account of the Ukioye School) of Tadatake Sekibar, by Mr. Yoshisaburo Kuno, Japanese Assistant in the University of California.

friend is "so gay and so sad, so triumphant over circumstances, so expressive of the view of the world which explains his wood-cuts" * that it should be known to every admirer of his art. It is thus given by Prof. Edward R. Morse, who received it direct from a pupil of Hokusai whose father was a friend of the recipient of the letter:

"King Ema [a sort of Japanese Pluto] has grown very old, and is about to retire from office. He has accordingly had built for him a nice little house in the country, and wants me to paint a kakamono. I must start within a few days, and when I go I shall take my drawings with me, and take lodgings at the corner of Jigoku dori Nichome [Hell Street] and shall be very glad to have you visit me when you have occasion to go there. HOKUSAI."†

On his death-bed he is said to have exclaimed, "If heaven would give me but another five years . . . I might yet become a great painter." He was buried in the garden of the Seikioji temple at Asakusa, and on his tombstone was cut the epithet he so frequently put on his designs, "the old man mad about painting."‡

He came too late in the history of color-printing to contribute much to its development, but as an artist he influenced to a greater or less extent all who came after him. Of his immediate pupils the most successful was Kiosai, sometimes from his faithfulness to his master's style and method termed Hokusai the Second. Though Dr. Anderson terms him "as poor, as eccentric, and almost as gifted as Hokusai himself,"§ Kiosai's range was comparatively narrow; he lacks Hokusai's amazing versatility, and only in his comic work challenges comparison with his master.

While M. Geffroy's statement, "All Japanese artists

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* La Farge, Century Mag., 24:427.

† Morse, Edw. R.: Notes on Hokusai. American Art Review, 1:147.

‡ De Goncourt, Hokousai, p. 264.

§ Anderson, Wm.: A Japanese Artist, Kawanabe Kiosai. International Studio, 6:29.

have been landseape painters,"* may be true, it is also true that in the Ukioye school, as in European art, the independent treatment of landscape eame rather late in the development. Again as in European art, landscape first made its appearance as a background for figure-pieces. The first to treat it for its own sake was Toyoharu, who is said to have derived the idea from some European woodcuts introduced through the Dutch Colony at Nagasaki.† His crude endeavors were continued by his pupil Toyohiro, but not until Toyohiro's pupil Hiroshige began his work in the third decade of the last century were landseape-prints produced worthy of comparison with the best figure-pieces of the eighteenth century. "In Hiroshige's new method the Japanese beheld for the first time landscape art as a mosaic of characteristic local colors. His skies were solid blue, pink, purple, or lead-color, with clouds or sunsets in realistic hues; his foliage solid greens of opposing values. The reds of temples, the browns and grays and azures of wooden bridges and buildings, even the colors of peasants' clothing, enter the same scale with colors of sky and earth, diversifying rather than dominating them."†

He moreover adopted, though with imperfect knowledge, European perspective, so that his landscapes please many to whom Japanese prints in general are caviare. Though he illustrated many other localities, his favorite subjeets were Yeddo and its environs; the Tokaido, the sea-coast road connecting Yeddo and Kioto; and the Kisokaido, the inland road between the same cities. He excels in representations of moonlight, snow, mist, and storms. He did not confine himself to landscapes, but drew birds, flowers, and fish with marvelous fidelity; illustrated history and legend; and published figure-pieees similar to those of Kunisada and earieature broadsides after the style of Hokusai. "Outside

* Geffroy, Gustave: Japanese Landscape Painters. Artistic Japan, No. 32, p. 409.

† Fenollosa, Mary McNeil: Hiroshige, the Artist of Mist, Snow, and Rain. San Francisco, 1901, p. 8.

his landscapes," however, "there was little in his work that would earn him distinction in his school, but in his specialty he stands far above his fellows."* Von Seidlitz calls him "the last great master of Japan."†

Thoroughly to enjoy Japanese prints one must so far as possible divest himself of many of the tastes and ideals formed by a study of our own art. De Quincey's dictum in regard to a certain class of literary works, "Not to sympathize is not to understand" must, if this exotic art is to be appreciated, be supplemented by its converse, Not to understand is not to sympathize. The connoisseur may readily grant that in a print the perspective is false, the proportions of the figure incorrect, and the drawing, especially of the hands and feet, ridiculous; and yet he may find the picture full of charm. It must be kept in mind that during the best period of Japanese color-printing a picture never lost its decorative and calligraphic character. Realism was no part of the artist's aim; the curtain so painted as to deceive the beholder into an attempt to put it aside would have awakened only his scorn. Mr. Theodore Wores tells us that a native painter in Japan thus criticised European art: "It seems to me that your chief aim is to produce a real effect; in fact you strive to make your picture look so real as to deceive one into a belief that he is looking at nature. Now do you think this can be accomplished with paint?" On the other hand, he further tells us, "It is the spirit more than the substance that the Japanese artist strives to reproduce."‡ Nature furnishes him merely an alphabet whose letters he strives so to combine as to produce poems, rhythmical creations of harmonious beauty. By giving only what is absolutely essential, by the placing of his masses, by gracefully flowing lines, and by a tender harmony of colors, the artist tries, not to

*Anderson, Wm.: Hiroshige. Artistic Japan, No. 16, p. 197.

†Seidlitz, W. v.: Geschichte des japanischen Farbenholzschnitts. Dresden, 1897, p. 198.

‡Century Mag., 16: 683,2.

imitate his subject, but to call up in his beholder feelings and sentiments similar to those aroused in himself by that subject. "To understand his paintings, it is from this standpoint they must be regarded; not as soulless photographs of scenery, but as poetic presentations of the spirit of the scenes."* In a word, long before Manet, Monet, and Degas the Japanese artists were impressionists, and their influence on the latest phases of French art has not as yet been adequately recognized.

Here there was undoubtedly a relation of cause and effect, but no such relation can be traced between the Japanese artists and the masters of another school with which they have much in common. One who knows and loves early Italian art cannot but be strongly reminded of the frescoes of Cimabue and Giotto and the panel-pictures of Giovanni Bellini and Vittore Carpaccio as he gazes at the best work of the masters of the Ukioye,—Kiyonaga and Yeishi, Harunobu and Utamaro. Here is found in perfection that "sweet unloaded flavoring of personal predilection without the taint of personal self-display" that Sir W. M. Rossetti, in somewhat "precious" diction, tells us the members of the Preraphaelite Brotherhood found so alluring in the work of the painters that they took as their masters.

The decorative nature of Japanese painting makes it much more akin to our mural painting than to our easel pictures. It has the same simplicity and "flatness," but in much greater degree; pictures being considered finished that seem to us merely sketches, and chiaro-oscuro being almost entirely neglected. It has, moreover, certain characteristics that are no more true of our mural painting than of our easel pictures: the point of view is almost always high, as in all early art; the perspective, before Dutch influence made itself apparent, is ludicrously false; conventions are freely used; and a color-scheme entirely different

* Lowell, Percival: The Soul of the Far East; III, Art. Atlantic Mo., 60: 620.

from that of nature is frequently adopted. Some of these peculiarities deserve more particular consideration.

No attempt was made to give apparent relief to a figure by light and shade, shadows being well-nigh universally omitted. Peter Schlemihl would have found himself quite *à la mode* in Japanese-print-land! A landscape by Hiroshige and a picture of a young girl standing in the snow by Yoshitora are noted simply because in them shadows *are* represented. This absence of shadows, combined with the frequent lack of background and of all support or base, often makes the figures appear as if cut out and pasted on a sheet. This peculiarity does not affect us as strongly as it did the early collectors, for our poster-artists, deriving the idea directly from these prints, have made us familiar with pictures of this sort.

It follows as a corollary from what has been said that the color represented is usually "local color"—usually because the pictures of rain and mist by Hiroshige certainly do represent atmospheric effect. As has been suggested, the painter was unusually daring in his use of color and was not at all trammeled by the facts of nature; if his color-scheme seemed to demand it, he did not hesitate to make his sky yellow, his trees blue, and his water red. And the fact that our attention is not attracted to the incongruity is a tribute to his knowledge of color-harmony. The impression given is sometimes just what one would receive from the scene, though hardly an object in the picture is represented in its true color.

The conventions of the painters, it is frequently difficult for us to accept. Nowhere is the idealistic and conventional nature of this art more apparent than in the representation of night scenes. Everything is usually seen as distinctly as if in broad daylight, only the introduction of lamps or lanterns, if the scene is an interior, of the moon or a dark gray or deep blue sky, if it is an exterior, denoting the difference. The famous subject "a black cat in a dark room at midnight" would have presented no

difficulties to the Japanese artist: he would simply have represented the cat standing or lying at the foot of a lamp, and both as distinctly visible as if the time were high noon. Here again Hiroshige breaks away from the usual practice: in a glorious print representing a fête on a river, the houses and trees on the farther shore are dimly seen in darker blue againt a deep blue sky; the middle distance, an island in the river, is in gray with the houses and merry-makers more apparent; but the party in the foreground is represented as if in strong daylight, even the details of the patterns on the *kimonos* being represented!

The treatment of the sea is also highly conventional. Seldom is there an attempt to represent "the multitudinous seas": usually a few lines in the foreground are considered sufficient to suggest "the waves of the numberless waters," while the background of the sea-scape is untouched paper up to the line that represents the horizon. Sometimes a tremendous wave is shown breaking in the foreground, while just beyond it the sea appears to enjoy a halcyon calm. A further peculiarity of the water is that usually it neither reflects nor refracts. In a few prints by late men, Kuniyoshi, for instance, reflections of the moon or of the piers of a bridge are to be seen, but even in these prints other objects are unreflected. No swan on Hiroshige's lake "floats double, swan and shadow."

Clouds also presented great difficulty to the color-print designer until the invention of gradation printing. In the later prints of Hiroshige the lightness and fleeciness of clouds are thus admirably represented, but in his early prints, as in those of Hokusai, there are simply sharp-cut decorative labels of color to indicate clouds. Sometimes these occur in a puzzling manner, and apparently are introduced, not to represent clouds or anything else, but simply to help out the color-scheme.

Finally the figures represented were ideal and conventional. Hokusai and Kiosai were much more realistic in this respect than the artists of the eighteenth century, but

they too had their conventions. Of the women of Shunsho, Yeishi, Toyokuni, Utamaro, and Harunobu, Dr. Anderson says: "The gorgeously attired women . . . are pure conventions, that bear scarcely any resemblance to the real Japanese maiden either in features, form, or proportions. . . . They are not the women of Japan or of any other country, but of the artist's imagination."*

Having once opened their doors to foreigners, the Japanese were quick to learn from the Western nations, and events in China during the last few months seem to indicate that they have "bettered the instruction," and are now able to give lessons in organization, discipline, and self-control to the nations of Christendom that have hitherto been their instructors. The progress of the country and the rapid adoption and assimilation of Occidental arts, sciences, and social ideals during the last third of the century just closed has provoked the wonder and admiration of the world. That the old feudal and caste system would be swept away so easily, so quickly, and so completely could not have been anticipated from the history of the centuries during which the country was a hermit nation. The change was necessary if Japan was to preserve its autonomy, and it would be idle to deny the manifold advantages it has brought to the Japanese. But in the exchange of old lamps for new it was almost inevitable that, with a deal of antiquated rubbish, there should pass out of her possession one of magic-working power. The old art is gone as completely as the age of chivalry. That of to-day is a hybrid. Even in the works of Hokusai and Hiroshige traces of European influence have been noted: contemporaneous Japanese art is saturated with it. Full of superficial prettiness and facile cleverness, it has lost the simplicity, naive charm, and subtle harmony of color and of line of the old Japanese; and it has not gained the solid excellencies of the European. *Nishiki-ye* are still produced, the popularity of the broadsides representing events in the

*Japanese Wood Engravings, pp. 28, 30.

Japanese-Chinese war having brought about a revival of an industry that was languishing. But from a collector's point of view the prints of Ogata Gekko, and Yoshimune Trai are valueless—save as foils to make apparent the worth and beauty of the color-prints of *old* Japan.

Fuit Ilium! And over the entrance to one of the museums in which, after the masterpieces of their art have been scattered to the ends of the earth, the Japanese are tardily endeavoring to collect what still remains in the country, might fitly be inscribed Emerson's words: "For everything you have missed, you have gained something else; and for everything you gain you lose something." Japan now has most of the nuisances, many of the conveniences, and some of the blessings of our civilization—and Japanese art has paid the price. How heavy that price, the Japanese themselves have begun to realize; as was evidenced by the closing of the Foreign Art School and the opening of the School of Native Art in 1888. Its influence is already apparent,* but a truly national art is impossible at the present stage of Japan's development. That of to-day is not "bone of its bone, flesh of its flesh," as the Ukioye formerly was.

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*Fenollosa, Ernest F.: Art in Contemporary Japan. Century Mag., 24: 577.

THE PHŒBE HEARST ARCHÆOLOGICAL EXPLORATIONS.

At a meeting of the Regents of the University held March 13, 1900, President Wheeler reported "Mrs. Hearst has for some time past been interested in the collection of materials which should ultimately find their place in an archæological museum at Berkeley, and with this in mind she has engaged the services of certain collectors and investigators who are now at their work. Dr. George A. Reisner has been employed to conduct archæological work in Egypt for the University of California and has been engaged for a term of five years.

Dr. Uhle has been engaged to conduct archæological work in South America and Yucatan. Term five years.

Dr. Philip Mills Jones has been engaged to conduct the same kind of work in California, New Mexico, and Old Mexico.

Dr. Alfred Emerson, recently Professor of Archæology at Athens, is now on his way to California to confer with Mrs. Hearst in regard to undertaking similar work in Greece and Etruria, and whatever the results of his work there will be, will inure to the University of California."

These explorers have been remarkably succesful in their work, and it is thought that an account of their discoveries will be of interest to all friends of the University.

Dr. Emerson visited Berkeley during April and May and delivered several courses of lectures at the University and in the vicinity. After completing these he went abroad empowered by Mrs. Hearst to expend $20,000 during the

next two years in securing Greek, Etruscan, and Roman antiquities. He has already secured an interesting collection of antique glass and of faithful modern imitations of valuable originals in the great museums of Europe; a number of Etruscan bronze mirrors, utensils, fibulæ, vases, and statuettes; several Cypriote and Rhodian vases and terra-cotta figures; a collection of Roman medals from Augustus to Maximinius; and a very interesting greave in repoussé bronze, said to have been brought up by a Greek island sponge diver. A London artist has been employed to make faithful copies of the Fayoum portraits in the National Art Gallery. He has been carefully taught by Dr. Emerson all that is known of the technique of Greek encaustic painting, so that so far as possible the copies will have the quality of the originals.

Dr. Philip Mills Jones has obtained by purchase and by opening burial mounds a collection of bones, utensils, arms, and ornaments of great importance to students of ethnology and of the archæology of the Indian tribes of California and New Mexico.

At the meetings of the Archæological Institute of America and the American Philological Association, held in Philadelphia during December, President Wheeler presented a report of what had already been accomplished by two of these explorers, Dr. Reisner and Dr. Uhle, and from the account of his remarks in the New York *Sun* of Dec. 30, 1900, the following facts are gathered:

After a preliminary reconnaisance in September, 1899, Dr. Reisner fixed upon Der el Ballas on the left bank of the Nile, and Kuft, or Coptos, on the opposite shore, midway between Luxor and the second cataract of the Nile, as the field for his first excavations.

At Coptos work was begun December 6, 1899. Eight tombs of the New Empire were excavated and planned and a number of very late vaulted tombs cleared; a flint camp, yielding archaic pottery, grindstones, whetstones, flint

knives, arrow heads, and axes, and bone needles, was excavated; and the location of a great cemetery was ascertained.

At Shurufa, in an archaic cemetery almost completely plundered in modern times, a collection of late archaic pottery and some slates was obtained.

At Der el Ballas, where from sixty to two hundred and ten men were at work from February 12 to July 12, 1900, rich results were obtained: a palace, a number of private houses, and two cemeteries were excavated; and a large collection of pottery, jars, scarabs, needles, chisels, grindstones, jewels, ornaments, and statuettes was found. By the end of the season the *kom*, or palace, had been cleared from its western side for about two-thirds of its extent. It was found to contain a large public building built of enormous, carefully-made, mud bricks, laid in thick massive walls. The main building rested on a platform at least twenty feet high, and was surrounded by halls of wooden columns resting on stone bases. In making these bases reliefs and inscribed stones of the earlier part of the Middle Empire had been used, and among them were five or six of great interest. The best piece contains on one side a relief of the New Empire; another shows part of an offering scene. In the palace were found a beautiful bronze dagger with an ivory handle, and a number of bronze axe heads, spear heads, and chisel points. In the houses west of the palace were found a room with painted walls, a room with wooden columns on stone bases, a stele from a tomb, and an interesting collection of dolls.

The most valuable and interesting objects were found in the southern cemetery of Der el Ballas. It contained about three hundred tombs of the seventeenth and the first part of the eighteenth dynasties, a period from which heretofore but little material had been found. A fine collection of scarabs, alabaster pots, and pottery was obtained, besides choice ornaments of gold, carnelian, and amethyst. Some of the best pieces are of bronze covered with gold, a necklace of

rosettes being particularly fine Two funerary stelæ were also found and a monkey of faience.

At El Ahaiwah, where work was begun May 21, 1900, a fort, a town stretching along the banks of the Nile, and two cemeteries were found. Though many of the graves in the archaic cemetery had been plundered, some were undisturbed and yielded a rich and characteristic collection of ivory hair pins, bracelets of ivory and of pottery, slate palettes, necklaces of carnelian, garnet, gold, and glazed stone, stone bowls, and alabaster vessels. A remarkable and unique specimen is the statue of a fox, about fifty-seven centimeters long, carved in slate. From the more recent cemetery, which dates from the twentieth or twenty-sixth dynasty, or even later, there was obtained an extremely rich collection of necklaces, many of them having the original stringing preserved, gold rings, ivory, faience, and amulets. Five or six houses excavated yielded objects of the same class and period. At the fort, the general plan of which was made out, there were found a number of inscribed stones, one with the cartouche of Rameses X, a number of bronze implements, scarabs, and papyri, including three unrolled documents. The fort was built apparently during the Middle or early New Empire, used as a fortress down to the end of the Ramasside period, and later occupied as the site of a Coptic town.

Several sarcophagi and a number of other of the antiquities discovered by Dr. Reisner have already been received at the University.

Dr. Uhle's object is to collect material illustrative of the civilization of the period of the Incas and of the older culture which flourished in certain parts of Peru before the days of the Incasic Empire; and since April, 1900, he has been at work in the Valley of Chincha in the interior of Peru. Little has been done in the way of securing material that could be transported, but much light has been thrown on the life of the periods before the Spanish invasion. Fixing his base at Huamachuco, a town on the western

slope of the Eastern Cordillera of the Andes some five hundred miles north of Lima, he first thoroughly investigated Marca-Huamachuco, a mountain eight miles to the west that rises two thousand feet above the valley and nearly twelve thousand feet above the sea level. On the summit which commands an uninterrupted outlook for from fifteen to twenty leagues were found many vestiges of the aborigines, who had here fixed their home that they might be free from surprise.

The Indian families which still dwell upon the summit have named the northeastern part of the ridge "El Castillo," because it was formerly surrounded on all sides by walls like separate fortresses, and because among the ruins on its summit is a main building called "El Castillo" in a narrower and special sense. On a second eminence is a building called "Cerro de Monjas," several enclosures on it being thought by the Indians to have been convents. Because of the decay of the ruins on the third part of the hill, this ridge is termed "El Cerro Viejo," and because of the court-like enclosures built upon it, a fourth eminence is known as "El Cerro de los Corrales." All of the buildings were constructed of broken stones, jointed with admirable skill, and diminishing in size from the base to the summit. Clay was used as mortar; hence, though some very high walls are marvellously well-preserved, the ruins generally are in a very dilapidated condition.

Though square buildings are found, the dominating type at Marca-Huamachuco is a round or irregularly oval enclosure with very few entrances. The characteristic detail of the enclosures is that they are all surrounded by double walls joined like a gallery. These galleries contain several floors connected by ladders and opening into the inner court. Some of the rooms of the upper floors have windows opening towards the exterior, but these were never of such a kind or so placed as to lessen the security against enemies. The interior of the enclosures is

generally occupied by small square buildings, arranged in no particular order, and having but a single story. The main building of the fortress, "El Castillo" in the narrow sense, rose by terraces, divided by walls into separate rooms, to a height of sixty feet or more. It is evident that the builders understood how to work stone by fire, and also the arts of polishing and carving; a few architectural stones bearing interesting ornamentation in bold relief were found.

The tombs at Marca-Huamachuco are of three kinds: tombs at the foot of shelving rocks; tombs in round or square burial places, enclosed by stones, upon the plain; and tombs in the walls of houses, without any external indication as to their presence. Dr. Uhle opened a number of these tombs, but found in addition to the human bones only a few needles of copper, two ordinary earthernware vessels, a small piece of cotton cloth, and the bones of guinea pigs.

The latest results in the neighborhood of Huamachuco were obtained upon the Cerro Amaru, or Hill of the Serpents, where there are three ancient conical wells. After a week's work Dr. Uhle succeeded in draining one well and washing out the mud. He thus obtained a quantity of blue, green, and black stone beads, and ornaments made from the *Spondylus pictorum*, a shell unknown in Peruvian waters, but found in the tropical seas between Panama and the Island of La Plata, off the northern coast of Ecuador. This shell was highly valued by the Peruvians, and used in their religious ceremonies. Dr. Uhle thinks that the wells were the objects of an ancient worship, and that the beads and ornaments were thrown in as religious offerings. Near the well was found a stone carved to represent the head of a wild beast. According to the Indians, three similar ones formerly existed, and were the guards of the wells. It is believed that this sculptured head, which is somewhat weatherworn, antedates the empire of the Incas, and is a survival from one of the oldest periods of Peruvian civilization.

Some time was spent by Dr. Uhle in the ancient town of Vivacochapampa, which belongs to a more modern period than do Marca-Huamachuco and Cerro Amaru, and presents a very different appearance. The ruins, which are probably from the time of the Incas, are spread out on an open plain at the base of a range of hills, and are arranged with suprising regularity. The town is in the shape of two parallelograms, separated by an eighteen-foot road still in use; and these are subdivided by walls into smaller squares In the middle of the town is a great plaza, about which were grouped the principal buildings. The dominating type of house is built gallery-like around three sides of an open court, the faces of the walls of the upper stories receding a little.

Near the town was found a small pillar-like stone bearing two faces that is thought to date from a very ancient period. At Ucros was obtained a stone head with carved features, supposed to date from the Incasic period; and at Baranchique two stone heads, supposed to be at least a thousand years old. The collection of sculptured stones contains, therefore, samples from the four periods of ancient Peruvian history. Some of the ancient rudely-painted pottery obtained in the Valley of Chincha is of a type not yet represented in any of the museums of the world.

Dr. Uhle, from certain evidences, believes that a civilization considerably antedating the Incasic, existed in the department of Ica, and he is now in search of its remains.

In addition to the explorers named by President Wheeler in his report to the Regents, Messrs. Grenfell and Hunt, formerly of the staff of the British Museum, were employed to make excavations in the Fayoum, Egypt; and in the *American Journal of Archæology* for December, 1900, there is a succinct account of their work.

At Umm el Baragat, the ancient Tebtunis, they discovered a cemetery of human mummies and one of the mummies of crocodiles. As wrapping and fillings there had been used a vast number of papyri, some demotic but

the most of them Greek. The number of Ptolemaic Greek manuscripts thus recovered exceeds that previously contained in all the museums and collections of the world. The remains of a temple of Saknebtunis, a Coptic church, and several houses were uncovered; and an interesting and valuable collection of coins, vases, scarabs, and amulets obtained. In a Roman cemetery several portrait heads painted on wood were found. Two of these are of unusual interest, as one has on the back a sketch of the portrait on the front, while on the back of the other are memoranda for the painter, giving a brief description of the salient features of the deceased. These instructions seem to indicate that these "portraits" were to a large extent imaginary. In another Ptolemaic cemetery, six miles to the west, a few more mummies with papyrus cartonnage were found.

The Gizeh Museum has kept a representative selection of the miscellaneous antiquities and the most important of the demotic papyri. The rest have been sent to Oxford. After they have been deciphered and published they will be divided between the Gizeh Museum and the University of California.

THE SELECTION OF THE SITE OF THE UNIVERSITY AND ITS NAME.

President Wheeler is in receipt of the following letter from the Rev. S. H. Willey, one of the founders of the College of California that later developed into the University:

To President Wheeler,
University of California.

There is a statement abroad concerning the choice of the University site, which is incorrect. For example: Dr. Jordan, in his article in the Christmas Bulletin, a few weeks ago, said, "Horace Bushnell, famed in the East for large things, chose the University site at Berkeley."

I noticed a similar statement in Dr. Munger's book on Dr. Bushnell, and also in the Boston Congregationalist.

It is not surprising that this should be supposed to be true, inasmuch as it is known that Dr. Bushnell spent one whole summer here, looking for the best site. But it is not true. The Trustees of the College of California chose the site.

When all that section of country was one continuous grain-field, some of them in riding along the country road,—now College avenue,—observed the very striking landscape scenery, the mild air, and especially the dignified old oak trees, and the fine line of evergreen shrubbery which encircled the grounds.

This was early in 1855. Early in 1856 Dr. Bushnell came, and entered into our college plans with enthusiasm.

He joined us in our search for the best college site. We took him first to examine the present site of the University. He saw its strong points, but dismissed it at once on account of the small flow of water running in the stream. He did not visit it again.

After spending the summer and fall examining possible sites all around San Francisco Bay, he made a report of his observations to the College Trustees, which was published, and can be found in "The History of the College of California," pp. 21–34, in which he makes no mention whatever of the Berkeley site, nor does he refer to it in his correspondence.

He speaks of a site in Napa Valley as if it had been chosen. But the Trustees never took any action respecting it. After having done our college enterprise great good in many ways, Dr. Bushnell left for his home in the East early in January, 1857.

The Trustees of the College then carried on their examination for the best site for more than a year, paying special attention to the present site of the University. All preferred it by far to any other, if we could obtain an adequate water supply.

Engineers were employed to ascertain whether back in the hills a stream sufficiently large might not be found, that could be brought in, and remove the only objection to the site, which all would decidedly prefer in that case.

Early in 1858 the engineers reported that there was a copious stream, flowing the year round, that, according to their surveys, could be brought in, and pour its full flow into our reservoir, and that the right to take the stream, and the right of way along which to bring it, could all be obtained.

As soon as this report was received and had been thoroughly considered, the Trustees, at a meeting called for the purpose, and held in San Francisco March 1st, 1858, made choice unanimously of the present University site.

This the official records of the College Trustees, which are in the possession of the University, show.

Two years later, on April 16th, 1860, the Trustees held a meeting on the grounds, to set them apart, with appropriate exercises, as a seat of learning.

This meeting was commemorated by the Senior Class in the University, in 1896, when they affixed a memorial tablet on the rock around which the Trustees gathered on that occasion.

These are the facts that should become part of the traditions of the University. And it occurred to me that it would be well to mention them particularly to you, so that, when you have occasion to speak of them or allude to them, it will tend to establish a right understanding of the history of the University site.

Very respectfully yours,

S. H. Willey.

San Francisco, California, January 16, 1901.

Last February President Gilman of Johns Hopkins University presented to the University of California a volume of letters concerning the picture of Bishop Berkeley that now hangs in the main reading-room. Among these is one from the Hon. Frederick Billings, dated New York, 25 June [1873], in which he makes this statement concerning the choice of the name of the site:

"As to the name, we all worked away at names for the site. All sorts of ———view and of ———lawn and ———hill, etc., were suggested. Berkeley came to me as a sort of inspiration, and I knew it was the name, proposed it, and they all saw its fitness."

OFFICIAL ACTION.

At a meeting of the Regents held December 28, 1900, in accordance with the recommendations of the Faculties, the following degrees were conferred:

The degree of Bachelor of Arts upon Alice Linscott Freese, of Berkeley; Myrtle Jeannette Joseph, of San Francisco; Mabel Earle Kelsey, of West Saticoy; Thomas Drummond Mansfield, of Haywards; Margaret McCowan, A.B. (Iowa College, 1890), of Phoenix, Arizona; and Flora Wilson, of San Francisco.

The degree of Bachelor of Letters upon Robert Belcher, of San Francisco; George Otto Brehm, of Berkeley; Adrienne Cerf, of San Francisco; Benjamin Franklin Driver, of Sacramento; Karl Henrich, of Berkeley; Virginia Nason Klenck, Ph.B., '98, of San Francisco; Edward Gerhart Kuster, of Los Angeles; Dolores Eleuteria Machado, of Santa Monica; Margaret McLeod, of San Francisco; Henry Clinton Melone, of Oak Knoll; Clelia Augusta Paroni, of Berkeley; Olive Lord Taylor, of Berkeley; and Grace Abbie Tyrrell, of Berkeley.

The degree of Bachelor of Philosophy upon Joseph Everett Brand, of Berkeley; Carl Sophus Hansen, of Berkeley; and Frank Perley Nutting, of Berkeley.

The degree of Bachelor of Science upon Helen Louise Arents, of Alameda; Paul Castelhun, of San Francisco; Leo Eloesser, Jr., of San Francisco; Samuel Philip Maybach, of Dundee, Ohio; Marion Michener, of San Francisco; Kurt Schluss, of San Francisco; Ralph Stuart Browne, of Haywards; Aloysius Paul Mallon, of San Francisco; Vance Craigmiles Osmont, of San Francisco; and George Walter Monroe, of Monrovia.

The degree of Master of Science upon Sanford Alexander Moss, of Sheffield, Missouri. (Thesis: "Thermodynamics of the Gas Turbine.")

At a meeting of the Academic Council held February 8, 1901, the Military and Gymnasium Committee presented the following report, which was adopted:

The Military and Gymnasium Committee begs leave to report that Hearst Gymnasium will be ready for the accommodation of women students at the beginning of the academic year, August, 1901.

In accordance with the wishes of Mrs. Hearst and President Wheeler, the committee respectfully recommends that physical culture be required of all women during the first year of attendance at the University, for five times a week.

At a meeting of the Academic Council held February 8, 1901, the regulation providing for credit on first-grade examination in courses not registered was repealed.

At a meeting of the Academic Council held February 8, 1901, the Committee on Scholarships reported that the R. C. Daniels donation had been constituted a graduate scholarship for the academic year 1901–1902, and that the scholarship would be awarded primarily on the basis of scholarship and ability. The action of the committee was approved.

CURRENT NOTES.

One hundred and sixteen students entered the University at the beginning of the second term of 1900-1901. They are classified as follows: graduate students, twenty-eight; regular and limited undergraduates, forty-six; special students, forty-two.

Professor Adolph C. Miller, Professor of Finance in the University of Chicago, is giving courses at the University of California this term on Practical Economics, Public Finance, and Economic Theory. Professor Miller graduated at California in 1887, and was a member of its Faculty during 1890–91.

Mr. E. T. Perkins, of the United States Geological Survey, lectured before the engineering students on February 14 and 15 on The Topographical Methods of the United States Geological Survey.

The curriculum of the College of Commerce is being supplemented by lectures by practical business men of San Francisco on the professions and industries in which they are engaged. Already this term Hon. Horace Davis, formerly President of the University, has lectured on The Wheat Industry of California, Mr. Irving M. Scott on Ship Building, and Mr. William Greer Harrison on Insurance.

The National Academy of Sciences has made to the Lick Observatory a grant of five hundred dollars from the Draper Fund for the Promotion of Scientific Research for the construction of a first-class, one prism, modern spectograph.

Mr. W. M. Bunker of San Francisco has presented to the University a collection illustrating the chemistry of

structural materials gathered by him in a recent journey around the world, and Mr. John D. Spreckels has agreed to bring it to San Francisco in one of his vessels free of charge.

Through Mr. Galen Fisher, '96, now Honorary Secretary of the Student Young Men's Christian Association Union of Japan, the University has been invited to name five men to teach English in the high schools of the Yamaguchi Prefecture in the southern part of Japan. Messrs. C. W. Peck, '00, L. H. Tracy, '00, and Harold M. Nock, '01, have already been appointed.

At the joint meeting of the American Philological Association, the American Oriental Society, the Spelling Reform Association, the Archæological Institute of America, the Society of Biblical Literature and Exegesis, the Modern Language Association, and the American Dialect Society, held in Philadelphia December 28 and 29, the single speaker selected to represent the American Philological Association was President Benj. Ide Wheeler. His paper was on The Causes of Uniformity in Phonetic Change.

Thanks to the generosity of Mr. Wm. H. Crocker, who has agreed to defray the expense, the University is enabled to send an expedition to Sumatra to observe the total eclipse of the sun on May 17–18. Astronomer C. D. Perrine is in charge of the expedition and Mr. Ralph Curtiss, who after his return will be an Assistant at the Lick Observatory, has been appointed his assistant. They sailed on February 16 on the U. S. Transport Sheridan, and will establish a station at Padang on the west coast of Sumatra. Director Pickering of the Harvard College Observatory loaned two valuable lenses for the use of the expedition.

The first University meeting of the second term of 1900–1901 was held in the Harmon Gymnasium on January 18. John R. Mott, General Secretary of the World's Student Christian Federation spoke on "Dominant Impressions

Received on a World Tour among Students," and Professor Gayley gave an account of "Student Life at Oxford." At the second meeting, held February 1, Professor A. W. Small of the University of Chicago, gave a comparison between Eastern universities and Western, and Professor Adolph C. Miller, of the same university, spoke of the dangers that beset a large educational institution. Dr. Eli McClish, President of the University of the Pacific, at the third meeting, held February 15, addressed the students on the danger of neglecting the development of the emotional side of their natures, and Professor Bacon gave reminiscences of undergraduate life at Yale College thirty years ago.

Toward the close of the last term the University announced a plan for a wide expansion of the University Extension work.

The University now offers to organize extension study courses in any community in California in which not less than twenty-five persons will enroll themselves as members in the course. Each member will be charged a fee of five dollars for each course extending over a half-year, and a fee of ten dollars for a year course.

The instructor in each course will visit the community where it is given three times for a single term course and six times for a year course, remaining upon each visit a day, or longer if the number of students makes a longer stay necessary. Upon the first visit he will call the class together and give an introductory lecture explaining the nature of the course. He will then meet the members of the class individually for consultation with regard to reading and work especially adapted to their needs. Upon his intermediate visit or visits he will meet the members of the class individually for consultation in the forenoon and afternoon, and in the evening lecture before the class collectively and discuss with the members the problems incidental to their work. Upon the instructor's final visit,

he will again meet the students for consultation, will lecture, and will conduct an examination. Students may enroll merely as readers and not be required to take the examination.

The subjects in which courses are thus rendered available for any town in California during 1901 are—philosophy, pedagogy, history and political science, Oriental studies, Greek, classical archæology, Latin, English, French, German, mathematics, astronomy, mechanical engineering, civil engineering, agriculture, horticulture, and entomology.

For the second term of 1900–1901, the following University Extension courses have been announced:

I.—Diplomacy. Five lectures at Berkeley by Hon. John W. Foster, former Secretary of State, on The Practice of Diplomacy. There will be two lectures on The Duties and Immunities of Diplomatic Representatives, two on The Negotiation and Execution of Treaties, and one on Consuls.

II.—Economics. Two lectures in the auditorium of the Young Men's Christian Association Building, San Francisco, by Professor Adolph C. Miller, on The Trust Problem. The titles are as follows: 1. Trusts: Their Causes and Advantages. 2. Trusts: Their Evils and Remedies.

III.—English. Six lectures in the Mark Hopkins Institute of Art by Assistant Professor Wm. D. Armes on The History of American Poetry. The titles are as follows: 1. Colonial and Revolutionary Poetry. 2. The Poetry of the Middle States. 3 and 4. The Poetry of New England. 5. The Poetry of the South. 6. The Poetry of the West.

IV.—Education. Nine lectures in the State Normal School Building, San Francisco, by Dr. E. C. Moore, on The History of Education. The titles are as follows: 1. The Educational Theorists of Greece. 2. The Schools of Greece. 3. Education at Rome. 4. Some Teaching Institutions of the Early Church. 5. The Schools of the Monasteries. 6. The Educational Reforms of Charles the Great. 7. The Schools of the Arabs. 8. Education among the Jews. 9. The Beginnings of the Modern Period.

V.—Commerce. Six lectures in the Mark Hopkins Institute of Art by Mr. Lincoln Hutchinson on The Growth of American Foreign Trade. The titles of these lectures are as follows: 1. Commerce and

Civilization. 2. American Shipping and Carrying Trade. 3. The Balance of Trade and National Welfare. 4. Where We Trade and What We Trade. 5. Fair Trade, Free Trade, and Reciprocity. 6. Trade and the Flag.

VI.—Japanese. A class in the Japanese language will be conducted by Mr. Yoshisaburo Kuno in the Mark Hopkins Institute of Art.

VII.—Chinese. A class in Cantonese will be conducted by Mr. Walter Fong in the Young Men's Christian Association Building, San Francisco.

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GOVERNMENT BY PUBLIC OPINION.*

By ARTHUR TWINING HADLEY.

There are two quite distinct theories of democratic government; the individualistic and the socialistic. The former relies mainly on the self-interest of the various citizens, acting independently, as a means of determining and promoting the general welfare. The latter relies mainly on the votes of those citizens acting as a body. The individualist believes that the selfish conduct of each man and woman, if properly enlightened and subjected to a certain necessary minimum of restraint, can be trusted to work out results which will conduce to the good of the body politic. The socialist believes that this good must be sought by the collective action of the people; and that the machinery of government, by giving effect to those measures which, after proper discussion, the majority of the people believe to be desirable, is the agency on which we must place our chief confidence for the solution of political and industrial problems.

Most thoughtful men would agree that neither of these theories has proved wholly satisfactory.

Of the individualistic theory, this is now quite universally admitted. Even those who recognize most clearly what self-interest has done for political and industrial progress

*An address delivered at the Charter Day exercises of the University of California, March 23, 1901.

are compelled to acknowledge that it will not do everything. Its successes have been great; but they have not been unmixed with failures. It is a powerful stimulant; but it is by no means that panacea for social ills which so many economists and moralists have considered it. The exalted hopes of the individualistic philosophers during the first half of the nineteenth century have been followed during the second half by a depressing reaction.

Down to the beginning of that century, business had been hedged about by a multitude of restrictions which had been thought necessary for the general good. The removal of these restrictions proved to be of great benefit. By giving a man, as far as possible, the right to enjoy what he produced, we furnished him the best motive to work. We were thus able to dispense with the necessity of serfdom, and obtained much more effective service under free labor than ever was possible under compulsion. By guaranteeing a man the right to the unhampered use of what he possessed, we stimulated the accumulation of capital, and thus developed new methods of production which helped the community even more than they enriched the individual possessor. We were able to arrange a system of competition which prevented trade from degenerating into a fight between buyer and seller, and utilized it as a means of mutual advantage. The institution of private property was thus made a vast machine for turning self-interest to the service of the body politic. The literature of political economy, in the hands of Adam Smith and his successors, was occupied with developing the advantages of economic freedom; in other words, with showing how the enlightened selfishness of each individual could be made to contribute to the good of others as well as of himself.

Nor have these theories been confined to the field of economics. Outside of the realm of business, we have been developing moral precepts based on the same sort of selfishness. Instead of compelling the people to obey laws because they were imposed by a superior authority, we have

striven to show that they have a personal interest in obeying such laws—that by a violation of public advantage they will in the long run hurt themselves scarcely less than they hurt others. Not a few writers have gone so far as to proclaim that this is the only rational basis of social obligations, and that the attempt to impose any other theory upon a democratic community is an insult to its intelligence.

The restrictions contained in the old systems of class legislation, both in business and in personal conduct, had been so arbitrary that their abolition was of itself an improvement, and a moderately enlightened degree of self-interest could hardly fail of producing better business and better conduct. But as matters have advanced farther, we see that the consequences of this freedom, though preferable to the system which they superseded, are not in every respect ideal. What might result if all men were sufficiently intelligent to work them out to the best advantage is a doubtful question, which I shall not attempt to discuss. What does result, under the existing degree of intelligence, is a mixture of good and evil, better than that which existed a century ago, but far short of anything with which we can rest satisfied. Even in the field of economics we have learned that the coincidence of private interest and public interest cannot be made complete. However much we may preach the blessings of competition, we find that there are many cases in which competition will not work. However warmly we may champion the benefits of free labor and free capital, we reach a stage of development where the one cannot be obtained without a considerable sacrifice of the other. We have come to a point where we regard the principles of political economy in their true light, as a valuable scientific discovery, but not in their false light, as a cure for every industrial wrong.

The failure of the socialistic principle of government by the will of the majority is less universally admitted. The theory seems so plausible that people are inclined to overlook its historical fallacies and its practical failures.

Modern democracy has in its hands a vast political machinery, the legacy left by the monarchical or aristocratic systems of government which it has superseded. The social democrats believe that by the use of this machinery the voters can obtain all the benefits which the older system enjoyed in the way of coherent power, and that they can at the same time avoid the perversion of that power to destroy personal liberty, because authority is now vested in the whole body of citizens, instead of in a single class.

But the power for good, thus held by modern democracy, is in some respects more apparent than real. The machinery of government is a vast and complex thing, but it is not one which will run itself. It has to have force behind it. In a monarchy or an aristocracy it is easy to see where the force comes from. It is based on the superior military strength of a single individual or a single class. Where one man was preëminent above all others in his fighting power, he had the means of making his will respected at home no less than it was feared abroad. This state of things was seen in Homeric society. When Hector fell, all the Trojans ran; when Achilles fell, all the Greeks ran. It was a necessary consequence that the affairs of the home government were chiefly ordered by men like Hector and Achilles, in the interests of the families which they represented. Where military power was somewhat more widely diffused, there was a similar widening of political privileges. This was seen in the earlier days of the Roman republic. It was seen on a still larger scale in mediaeval Europe under the feudal system. In either case we had an order arranged chiefly for the benefit of the knights, who possessed the monopoly of fighting strength. Aristocratic government was an engine for keeping each man in his place in a social order of this kind. The selfish interest of the aristocracy itself formed at once the support and the danger of such an order. It was a support, because it made the government effective; it was a menace, because it ensured its perversion in favor of a single class.

The invention of gunpowder and the other changes in military tactics, which made larger armies imperative, put an end to the monopoly of power which the knights had previously enjoyed. Democracy was an almost necessary consequence of this change. The growth of democratic government, with its system of general elections, put an end to the possibility of reserving all political privileges for a single group. This is everywhere recognized. An equally important consequence, however, which is not everywhere recognized, is that it did away with much of the force which the older governments had behind them. Except in those grave crises when a wave of patriotism sweeps over the community, the support on which a democratic government relies is spasmodic and accidental. No man except the professional politician feels that the government is being run in his particular interest. On none, therefore, except the professional politician can it rely for continuous activity in giving effect to its decrees.

Yet more serious than this absence of compelling force behind a democratic government, as compared with an aristocratic or monarchical one, is the absence of continuity of policy and tenacity of purpose. A small group of men knows what it wants. It pursues common interests, and it has the power to pursue them with an unwavering fidelity. We see this advantage illustrated when we compare the diplomacy of Russia, which is managed by a few men, with the diplomacy of England, which is under the control of a great many men. The diplomacy of Russia is steady in its purpose, ready to wait when waiting is needed, quick to strike when promptness is imperative; and it is entrusted, from beginning to end, to the hands of acknowledged experts. The diplomacy of England is by contrast vacillating of purpose, impatient of necessary delays, unready in the moment of action, and handled by men who are chosen for reasons not wholly connected with fitness for their work. What is true of England in this respect is in even larger measure true of the United States. And

thus it happens that Russia, in spite of the inferior intelligence of her inhabitants and the lesser material resources at her command, is in a position to pursue diplomatic aims more surely and successfully than her rivals. If this condition shows itself in a field so restricted in its character as that of diplomacy, where the patriotism of the several countries enlists their inhabitants in a common cause, what must we expect when the same difference of method is applied to the whole field of domestic administration, whose purposes are infinitely complex, and in which the interests involved are divergent and antagonistic?

In the face of these difficulties, it is obvious that democratic government, to be successful in what it undertakes, should be managed with great caution. With the inevitable changes of purpose, due to the differing results of successive elections, it should confine its undertakings to those matters which have been thoroughly discussed and have preëminently commended themselves to the whole people. With its deficiency of physical force for carrying its decrees into effect, it should endeavor to restrict its action to those things where there is a sufficient consensus of opinion and a degree of acquiescence on the part of the minority which will render a preponderance of force unnecessary. But this caution is by no means characteristic of modern popular governments. "The new democracy," to quote the words of Lord Farrar, "is passionately benevolent, and passionately fond of power." Conscious of its honesty of purpose, it is impatient of opposition, and contemptuous of difficulties, however real. It undertakes a vast amount of regulation of economic and social life in fields where two generations ago a free government would scarce have dared to enter. In these new fields there are many instances of failure, and relatively few of success. We have had much infringement of personal liberty, with little or no corresponding benefit to the community. Prohibitory laws applied to places where there was no public sentiment behind them have proved a mockery. Anti-trust laws have

been so systematically evaded that they have degenerated into a means of blackmail; and they have often been so injudiciously drawn that their enforcement would have paralyzed the industry of the community. There is no need to continue the catalogue of appropriation and currency bills, and tax bills and labor bills, often devised with the best of intents of coercing the wicked, but ending in nothing except evasion and inconvenience.

Nor is it really possible that most of them should end otherwise. A statute passed by a majority and in the face of a reluctant minority does not represent the will of the people. It is legislation in favor of one class, which happens at the moment, through causes which may be good or bad, to control a greater number of votes at the polls, and against another class which can control a less number. Absolute majority rule, so far as it is really carried into effect, means tyrannical power in the hands of a weak and vacillating sovereign. There is a "curious political superstion," to quote the phrase of Herbert Spencer, that such rule by majorities was a fundamental theory of those men whose work at the close of the eighteenth century emancipated America and Europe from the bonds of the aristocratic system. But history gives no warrant for this belief. Rousseau himself, the father of modern democracy, is explicit in saying that the wish or vote of a majority does not necessarily represent the will of the people. The Constitution of the United States, so far from sanctioning unlimited rights of the majority against the minority, is filled from beginning to end with restrictions upon the exercise of such rights—restrictions devised in the interest of personal liberty. The Constitution indeed provides for elections to decide who shall govern us; but it in no wise encourages the intrusion of the officials thus elected into those fields of legislation where class and personal interests are arrayed one against the other.

Political aristocracy being a thing of the past, self-interest an inadequate support for political order, and over-

legislation an evil worse than that which it undertakes to cure, I believe that we have but one alternative before us if we would preserve our integrity as a nation. We must go back to the principle that a just government is based on the consent of the governed. Without that consent we have tyranny, even though the governing body possesses for the moment a majority at the polls. Without that consent we can have neither self-government nor freedom in its true sense. To maintain such freedom we must accept the principle of government by public sentiment.

This is a phrase which is often used, and almost as often ridiculed. The men who are engaged in what they call practical politics regard moral ideas in this field as a matter of slight importance, except in those rare national crises when the public is thoroughly roused. They say that for every instance of failure of legislation without public sentiment behind it you can give at least as glaring an instance of failure of public sentiment without legislative and administrative machinery to support it. They hold, in short, that government by moral ideas will not work.

I believe that this view, though widely held, rests on a misconception of what public sentiment really is.

Whenever a large number of people want a thing we hear it said that there is a public sentiment in its favor. This is not necessarily true. Even the fact that a majority may be willing to vote for a measure does not prove that it has this basis. The desire may be simply the outcome of widespread personal interest, and may not deserve in any sense the name of public sentiment or public spirit. Take the whole matter of anti-trust legislation. Most people object to trusts. Why? Largely because they do not own them. If a man really believes that a trust is a bad thing, and would refuse to countenance its pursuits if he were given a majority interest in its stock, he can fairly dignify his spirit of opposition to trusts by the title public sentiment. And it may be added that if things are done by trusts or by any other form of economic organization which

arouse this sort of disinterested opposition they speedily work their own cure. If a considerable number of influential men see the pernicious effects of a business practice sufficiently to condemn it in themselves, as well as in others, they can speedily restrict, if they cannot wholly prevent, its continuance. Most of the effective control of combinations of capital has been in fact brought about by intelligent public opinion slowly acting in this way. If, however, the critic is doing on a small scale what the trust is practicing on a large scale; if he is making every effort to sell his goods for as high prices as possible, not being over-scrupulous as to the means by which this is brought about; if he in his own way tries to monopolize the market as the ill-managed trusts monopolize theirs; if, in short, he simply complains of the practices of the trusts because he is at the wrong end of certain important transactions, and becomes their victim instead of their beneficiary, then his words count for nothing. No matter how many thousands of men there may be in his postion, their aggregate work is not likely to reach farther than the passage of a certain amount of ill-considered and inoperative legislation. Take another instance from similar ground—that of the silver movement. Here the matter was more complex. A certain amount of agitation in favor of silver was based on a real feeling that gold had appreciated, and that this produced an unfairness which was repugnant to the moral sense of the community. So far as this state of feeling existed the agitation had real strength, independent of the question whether the facts on which this feeling was based were rightly or wrongly interpreted. But at least an equally large part of the silver movement was based, not on the feeling that the exclusive use of gold hurt the public, but on the argument that it hurt certain individuals. When these individuals were therefore urged to vote for a change, not because one kind of money was better for the public than another, but because it was better for them to pay their debts in cheap money, then the silver agitation

became an appeal to class interests which could command no power except that which was represented by the votes of the class in question. This does not mean that the appeal to class interests was any less marked on the other side; but it means that even if the movement had been successful, the resulting laws would probably have been inoperative in practice, because imposed by a majority upon the transactions of a reluctant minority. It cannot be too often repeated that those opinions which a man is prepared to maintain at another's cost, but not at his own, count for little in forming the general sentiment of a community, or in producing any effective public movement. They are manifestations of vainglory, or envy, or selfishness, rather than of that public spirit which is an essential constituent in all true public opinion.

There are some moralists who would deny the possibility of any such public opinion which should be independent of selfishness, and which should rise above personal interests. But they have the facts of history against them. Aristotle has well said that man is a political animal. He has an instinct for forming communities, and for acting in concert with the fellow-members of those communities. Every such political community or unit has its code of political ethics. Under the influence of this code a man will do things which are quite independent of his personal selfishness, and which may even militate against the dictates of such selfishness. The spirit of patriotism will lead him to risk personal suffering and death itself in the service of that community; it will even lead him to submit to discipline and to restraint which is irksome in the extreme. He will acquiesce in the results of laws which place burdens upon him for the benefit of others. A community in which such patriotism and public devotion were wholly absent could no longer remain a people by itself. It would be daily threatened by conquest from without and by dissolution from within.

Public sentiment, or public spirit, is the name given to

the feeling which gives effect to these virtues. It represents each man's share in that political conscience which is as important for the ordering of the affairs of the state as is the personal conscience to the ordering of the affairs of the individual. Public opinion is a judgment formed in accordance with the dictates of this political conscience, and representing a theory which a man is prepared to apply against himself as well as against others.

Where it exists, such public opinion is not only powerful, but all-powerful. It can accomplish more than any other coercive agency in the world. Take its operation, on a small scale, as brought out in the recent hazing investigation at West Point. When the public sentiment of the cadet corps is brought into conflict with the regulations of the Academy, the unwritten code of honor proves the stronger. We may differ as to our opinion of its merits, but of its power there can be no question. And the power which is here illustrated on a small scale has been repeatedly exemplified on a large scale in the history of public and private morals. What is it that has rendered murder a rare exception instead of a frequent social event? It is not the existence of statutes which make murder a crime; it is the growth of a public opinion which makes the individual condemn himself and his friends, as well as his enemies, for indulgence in that propensity. There were laws enough against murder in Italy five hundred years ago; but these laws were practically inoperative, because they had not really formed part of the social conscience, as they have to-day. On the other hand, the social conscience of mediaeval Italy, with all its laxity in the matter of murder, was strict in certain matters of commercial trust, on which it is to-day relatively loose. A man actually forfeited self-respect by a questionable financial transaction in those days as he did not forfeit it by the murder of two or three of his best friends. As a consequence, that particular kind of financial immorality was much rarer then than it is now. Such instances can be indefinitely multiplied. Whatever may be

the dictum of the theoretical moralist, no student of social order will doubt that public sentiment, if once aroused, can be made to dominate the action of individuals and lead them to do things which, from the standpoint of selfishness, are inconvenient and irrational.

But can public sentiment be thus aroused to do any large portion of the work which we now demand of government? Admitting its power in those cases where it already exists, can its application be widened at will, so as to reach those financial and social wrongs in which the pursuit of self-interest has involved us? This is a fair question, which must be fairly answered.

It may be frankly recognized that it will not do all those things for which numbers of people now desire legislation. This fact, however, can be considered a merit rather than a fault. If any agency were found to give effect to all the ill-considered demands of our majorities, there would be no more freedom in America than there is in China. That it can be made broad enough to cover the field where legislation has proved practical and salutary is, I think, scarcely open to doubt. One or two instances will help to illustrate this. The history of liquor laws shows that the attempt to enforce prohibition on all localities indiscriminately, independent of the public sentiment which lay behind them, resulted not only in defiance of this law, but in degradation of the authority of the State itself; and that the really effective control was accomplished by statutes so framed that public action went hand in hand with public opinion. The history of railroad legislation in the United States furnishes even more marked instances of the same sort. It has been a pretty constant record of the success of measures which undertook little, but provided for much publicity, as compared with measures which undertook much, but tended to drive the recusants into the dark. If this has been the case hitherto, when the development of public opinion has been treated as a mere accident, how much more may we expect it to prove true if the principle

were once brought home to the citizens as a body that public sentiment was the important thing on which to rely, and that they could not afford to devolve upon the legislature or the administration a responsibility which must finally come home to themselves. That the better class of American citizens would refuse to accept this responsibility, when thus squarely brought home to them, I do not for one moment believe. In the matter of personal morality they do in fact accept it. In no nation is the influence of sympathy for others so powerful; in none are the strong so ready to sacrifice their convenience to the comfort of the weak. That these methods are not carried out in our business and our politics is, I believe, due to false theories of government, accepted by the community as a whole, which lead men to rely too much on self-interest and on legislation. If our people can accept cheerfully those burdens involved in the duties of private life, there is no inherent reason why they should fail to accept the trusts of public life. That they are now inclined to make light of their obligations to others, in business and in politics, is not due to any incapacity for taking such obligations seriously; it is due to the fact that they have been taught to regard business and politics as games, with no obligations profounder than the rules and no authority higher than the umpire. It is this inadequate conception of public responsibility, rather than any reluctance to sacrifice themselves where a responsibility is recognized, that now stands in the way of our progress.

What rules of conduct public opinion would prescribe in order to meet the political and industrial dangers under which we suffer, it is too early to say. What specific obligations the public conscience, when once aroused, would regard as binding in matters like this, we have no time to consider at present. It would take not one hour, but many, to discuss the uses which could be made of such a power, when once fully recognized as a working force in political life. It is enough for the moment to call attention

to the fact that this power exists; that it is an instrument fitted to meet the most urgent wants of society to-day—strong where strength is needed, slow where conservatism is required, capable of indefinite expansion without threatening the foundations of self-government. It lies for the time unused; but it waits only the mind which shall discern its possibilities and the hand which shall wield it in the public interest. To the men who will thus see it and use it it offers the opportunity to become leaders in a higher type of social order than any which the world has yet seen —an order in which the principle of *noblesse oblige* is recognized, not as the exclusive glory of one class, but as a democratic possession which imposes its honorable burdens upon the whole body of the people.

The question is often asked what constitutes the essential mark of a gentleman, as distinct from the accidents of birth and of clothes, of manners and of speech. I believe it is to be found in the readiness to accept trusts, even when they are personally disadvantageous—the readiness to subordinate a man's own convenience and desires to a social code. The code may be a good one or a bad one; but it is an authority which the gentleman accepts of his own free will, without waiting for any one to compel him to accept it. To the extent that he does this, he not only proves himself a gentleman, but proves himself capable of self-government. In this sense I believe that the great body of the American people are gentlemen, and are therefore capable of self-government. There is much which is as yet defective in our commercial and political code of honor. But the fundamental fault is in the code and not in the man; and therefore the task of the reformer is no insuperable one.

The thing that makes democracy practicable is a willingness on the part of the mass of the people to submit to self-imposed authority without waiting for the policeman to enforce it. The cause of democracy was, as we have seen, the distribution of fighting power, which formerly had been confined to one class. The possibility of main-

taining democracy is due to the fact that the readiness to accept self-imposed burdens has gone hand in hand with the distribution of power. The danger of democracy lies in the adoption of a false code of honor, which tolerates and approves the pursuit of self-interest in lines where it must prove ultimately destructive to the community. If our men of influence can see these dangers in time to submit to self-imposed restrictions, they can preserve their freedom from legislative interference, and our republic can remain, as it now is, a self-governing body. If they do not see it in time, the demands for the extension of legislative machinery and police activity will so far restrict our personal liberty that democratic freedom will exist only in name, and we shall have a social order where the form of an occasional election is but a decent veil to disguise struggles for the tyranny of one class over another.

It is for the young men who are coming on the field of political life to-day to guard against this danger. You, as college students, have lived in a community which has its historic traditions and its collective aspirations; which is in a true sense a body politic, with its public spirit and its public sentiment. It is for you to carry into the larger world of business and of legislation the spirit which will subordinate personal convenience to collective honor. Cease to appeal exclusively to self-interest, either in your own judgment or in the judgment of others. For a political leader who not only has fixed standards of right, but a belief in the capacity of the people to accept those standards, the times are always ready. Calhoun and Clay and Webster and Lincoln differed in their judgments and in their conclusions. But it was characteristic of them all that they made their final appeal, not to the narrow interests of any class, but to what they believed to be broad principles of public opinion and public morality. It was in the spirit of these men that our republic gained its growth during the century that is past; it is for us, their sons, to see that the same spirit is applied to the yet larger problems of the century which is to come.

SOMETHING ABOUT THE SCIENCE AND THE ART OF SHIPBUILDING.*

By Geo. W. Dickie.

I.

I do not expect, and I trust that none of those who have come to hear what I have to say on the art of shipbuilding will expect, that much can be done even with the beginnings of such a subject in two short lectures. If I succeed in presenting such an outline of this great art as will attract the attention of either teacher or student to the importance that this subject may assume in the future history of this State, I shall be fully satisfied with such a result as a recompense for the time spent in preparing these lectures, which can only touch the fringe of such a vast subject.

For the past year or two there has been a gradual awakening of the people of this country to the importance of naval power, both commercial and military, to the future prosperity and stability of the United States. The importance of a great ocean-borne commerce that will equal the industrial capacity of the nation, is to be, I think, the dominant question with the men of affairs during the next years of industrial history in the United States, and in order to make that growing sentiment effective, every great

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university, especially those that provide the means of education in our seaboard states, should be thoroughly equipped to teach all that is teachable at a university of modern naval architecture.

With the compounding of the steam engine, and surface condensation, coupled with the new material of construction, first iron and later steel, all within my own experience as an engineer and shipbuilder, and the great modern necessity of speed, came the imperative demand for new forms, new dimensions, and new principles, necessitating a new science, now called the modern system of naval architecture, embodying within it the needs, the machine tools of the marine engineer, and requiring for its full development that we should ransack all the accumulated knowledge of modern science, all the refinements of mechanical skill, and all the education that universities, schools, and books can bestow.

Modern naval architecture is therefore a new science; modern shipbuilding is a new art, working new materials; and a modern ship is a new creature born of that science and art, animated by the breath of steam, guided in its course by navigators, driven by engineers, steered by hydraulic power, or by steam, or if just out, by electric energy; ballasted by water, worked and pumped by steam power, ventilated by electric blowers. If a warship, carrying guns each as heavy as a modern locomotive, so that they can be trained only on a turn-table operated by electric motors.

Wood has almost disappeared from the modern ship, for even the steel decks of our modern ships are not always carpeted with wood. Hard, tough, tempered steel thickens the sides of the warship against shot and shell. The telephone conveys the volition of the controlling mind from stem to stern, and from the magazines below to the military tops above. Counting machines in the engine rooms keep the ship's reckoning, and recording logs her rate of progress through the water. In size the length of our modern

ship lays the ordinary sea by spanning the crests of the waves, and her height out of water places her passengers, that is the first class ones, above the breaking sea.

We have about reached the time when every voyage connecting one country with another is performed by ships built for the exact purpose of that trade, and so fitted in size and character to the special duty they are to perform that their work on the high seas is performed with as much regularity, as little risk, and at as little or less cost as by the most economical and regular of modern railways on land. And so the time has come that some of the boldest men of science in the first half of the century just closed thought within the possibilities, when those who had a little time and more than a little money would no longer have to go out of this world ignorant of the beauty and the kindliness and the helpfulness of so many of the fertile, lovely, and teeming countries God has made and peopled, and adorned and blessed with countless food and wealth; but that those favored ones will be able to take with them when they leave this world a clear knowledge, a kindly recollection, a grateful experience of its varied climates, of the wide scope of human kindness, of the boundless blessings that come of mutual human help, and of the astounding wealth of all the blessings of human life, which in this world have been provided and stored up for those who have heart enough to do what is necessary to possess them.

I suppose you will be thinking that I am drifting into a discourse on the humanities of shipbuilding, but you need not fear any such result; it is only my way of edging up to my subject, looking for a weak spot where I might safely make an attack.

The new conditions of modern commerce are continually bringing new problems before the naval architect that the modern ship must solve. The way of an old ship was to rise over the waves. The way of the modern ship is to go through them. The way of the old ship was to take the sea easily, to ride well at her anchors in a storm; to lie to when

it blew hard, and to scud away before the wind when it was found most prudent to do so. The modern ship must have above all one quality; before all things she must be fast, easy through the water, but not easy on it. She must never have to lie to; never have to anchor, except in harbor at the end of her voyage. Straight from one port to another must be her path across the seas.

To meet this desirable quality many hard conditions must be reckoned with, for with it must be combined other desirable qualities that are very difficult to unite. Speed is most desirable in a modern ship, but with it must be united seaworthiness, durability, and economy; and under these a number of minor requisites, which the peculiar trade conditions for each ship prescribes and which her structure must fulfill.

The sciences that enable the naval architect to deal with these several and great problems are: how to make a ship float; how to make her carry a cargo; how to make her stand upright, when certain forces try to upset her; how to make her obedient to the will of her commander; and how, in addition to all these, to make her go easily through the water.

With these prime factors come the following problems: how to give a ship a given draft of water and no more, first when she is light, and second when she is laden; how, with the given draft of water, to prevent her oversetting when she is light and rises high out of the water, and how to prevent her being overturned by the great load laid in her when heavily laden; how, when the waves roll up on one side of her, to prevent them going over into her without at the same time heeling her so far over as to meet danger on the other side; how to make her rise to the sea forward so that the waves may not flood her decks, without at the same time, making her rise too far, inducing a plunge into the succeeding hollow, making her uneasy and slow; how so to form her stern that when running before a sea it shall not break over and poop her; if a sailing ship, how to

make her so stiff on the water that the wind pressure on her sails shall not upset her, without at the same time giving her so much stiffness as to carry away her masts by the jerk of the sea; how to make her turn around quickly and in short space, in obedience to her rudder, however fast she may be going, and how to prevent her going the way the the wind blows, except under the direction of her rudder; how, in combination with all the foregoing, to make her fast before the wind, fast against the wind, fast across the wind, fast when deeply laden, fast when light, fast when the sea is smooth, and fast when the sea is rough.

These are some of the problems with which the science of naval architecture must cope. They are all matters, the principles of which belong to pure science. They are all matters of forethought and calculation, for which exact results are to be sought and ascertained long before the shipbuilder can even set about his work. They form the science of naval architecture, as distinguished from the art of shipbuilding. And as they must be thoroughly understood by the designer of modern ships, I propose in this lecture to try to make plain to you how they are applied in ship design, and in doing so I can only touch upon the more important features of ship design, and in their simplest application. And I will endeavor to follow in this the order given.

The first two problems named, how to make a ship float and carry cargo, may be termed the foundation problem for the naval architect to solve.

The first question that the naval architect must settle in beginning the design for any given ship is the same question that the architect of a building must first settle, that of foundation. The size and weight of the building, with its contents, determine the character and extent of the foundations required. So the size and weight of the ship, with its load, determine, not the character of the foundation, for that is always the same, but the amount of foundation.

The naval architect calls his foundation displacement, and his unit of measurement for it is thirty-five cube feet, because that volume of sea water weighs one long ton. The law that governs the floating of the ship and what she can carry, is said to have been discovered by Archimedes. He is the man who said "Give me a lever long enough, and a prop to place it, and I will move the world." But he said something else of far more consequence to the shipbuilder: "Give me a weight, however great, and I will float it." This is the wonderful discovery which he is said one day to have made while taking his bath, when in his joy he so far forgot himself as to rush out shouting "I have found it! I have found it!"

He is therefore the father of naval architecture as a science, and in order to understand how to make a ship float, we must understand his great law of displacement.

Perhaps the best way to understand it is to study it as he did, by means of a bath. Take a bath tub six feet long, two feet wide, and three feet deep, and fill it two feet deep with water. Mark where the water stands in the bath, and get into it, letting yourself sink in the water until nothing but a portion of your face floats above. Now if I were you your weight would be 188 pounds, and you would find the water rise in the bath exactly three inches. I need not tell you that the rising of the water in the bath was caused by your body displacing it from the lower part of the bath which it previously filled, causing it to rise into the higher part. In short, by so much as the bulk of your body has put into it, by so much has the water been pushed out, displaced, and raised. If you could measure the exact bulk of your body immersed, and measure the exact bulk of the water raised, you would find them identical, bulk for bulk; and what is strange, but not obvious, is that they are also equal weight for weight. It was this that astonished Archimedes.

The principle of displacement consists therefore of two parts; first that a body placed under water displaces as

much water as its own bulk; second that it floats when it weighs less than the water it displaces.

To illustrate how this displacement of water, bulk for bulk, and weight for weight, forms a perfect and sure foundation for a ship, let us take for example a warship, say the battleship Oregon. The very first thing the designer had to decide was, how deep shall my foundation be? The depth of certain docks and harbors must be considered in reaching a decision, and knowing where the vessel had to go, this was fixed for the normal weight of the ship at twenty-four feet. This depth of foundation must therefore carry the structure with its normal load he is to build.

Having this important point settled, he must now get information from other experts. So he calls upon the engineer for the weight of all the machinery, the boilers and the water in them, that the foundation must carry for him. He calls upon the ordnance expert for the weight of all the armor, guns, and ammunition the foundation must carry for him. He calls upon the equipment expert for the weight of all the outfit, coal, and stores the foundation must carry for him. And then he figures out very carefully the weight of the structure itself, to be added to the weights furnished by the other experts, and the result is that the foundation must carry 10,400 tons.

He must now consider how wide his foundation will be. The position of the center of gravity of the weights that he has to carry above the base line of the foundation helps him to determine this dimension. Here he also consults all the gathered experience of his profession, with the type of ship nearest to the proposed design, the result being that he decides on a width of 69 feet.

Now if he was to build simply a rectangular structure, the weight of which was 10,400 tons, he would find that at 35 cube feet to the ton, the cubic contents of the foundation would be 364,000 cube feet, the depth having been settled at 24 feet, and the width at 69 feet; the length would therefore be 220 feet.

This would be the smallest dimension of foundation that would carry the load, and is called the box displacement; that is, a box 220 feet long, 69 feet wide, and 24 feet deep, if filled completely full, would contain 10,400 tons of sea water, the exact weight of the battleship and the exact bulk of that part of her that is below the surface of the water, although not the form possessed by the under-water body of the vessel.

Here a great many considerations present themselves in regard to form. The naval architect knows that to add to the length would give him fine lines, and speed with moderate power, but would detract from other qualities that a battleship should possess; and speed, though very desirable, is not everything. So again he has recourse to experience, and this tells him that the difference between his battleship and a rectangular box must be somewhere between .6 and .65. So he decides upon .631, and this makes the length of the battleship 348 feet.

This proportion that the part of the ship that is in the water bears to a rectangular box is called in America the box co-efficient, and in Great Britain the co-efficient of fineness.

On this foundation of displacement floats our battleship, or any other ship we may design, and it is absolutely sure if the weights are correct. But if the weights to be carried exceed by any amount the designer's figures, the foundation gives way correspondingly.

The designer therefore must be sure of his weights, and of his dimensions, and his co-efficient of fineness, or his foundation will fail him. His ship will displace not an ounce more than her own immersed bulk.

The volume of water she displaces is said to represent the floating power of the ship. It really represents the buoyant power of the water acting on the outside of the ship. The ship itself has no power to carry anything, or to float. All it does is to exclude the water, and enclose the cargo. The ship is merely passive. The water carries both the ship and her cargo.

Buoyancy is therefore the power of the water to carry a given ship, and its power is exactly as the bulk of the body of the ship under water, and its force is measured by the weight of the water displaced, which we call the ship's displacement.

There is a very important conclusion to be drawn from this law discovered by Archimedes, and it is this: that the floating power of a ship has nothing to do with her shape, but is entirely due to her size or bulk in the water.

Practical shipbuilders of the old school, ignorant of the laws of naval architecture, have imagined that they could confer surprising powers of flotation and ability to carry heavy weights, merely by giving proper shapes devised by themselves to the immersed bodies of their ships. Some of them, of considerable eminence, passed long periods of their lives under this delusion, and a very distinguished one wrote a book on the subject; but the delusion passed away, and the authority of old Archimedes was established.

The fact, however, that practical men for long thought that form had something to do with buoyancy, shows that the principle of flotation is by no means self-evident, and that its discovery by Archimedes had great merit. Its great value to us is its admirable simplicity, its unquestionable authority, and its absolute exactness. To understand its nature is, however, less easy than to appreciate its value, and it will take a great deal of thought to understand thoroughly why no possible invention of shape can give to a ship the power of greater or less buoyancy than is measured by the exact weight of water which forms its displacement.

Form, however, has much to do with other qualities that a good ship must possess. For the naval architect, having determined the amount of foundation, that is displacement, that will carry his ship and her load or cargo, must now deal with another quality—that of stability, or the power of water to make a ship stand upright.

Here a complicated set of problems confronts the

designer. In a building the more stability the architect can secure the better, but in a ship there is always a desirable amount of stability required, and too much would be quite as undesirable as too little. It is therefore the business of the naval architect so to work out his design that the proper amount of stability will be attained.

That we should ask of the most unstable of elements to confer stability or give uprightness to heavy bodies raised to a great height above its surface, would appear to be an unreasonable expectation, did we not see it accomplished every day.

One might imagine at first sight that the upward pressure of water on the bottom of the ship should help to give uprightness to the structure it upholds from below. But this thought will not stand examination. To push the bottom of a thing upwards may be simply trying to upset it. What we want is to keep the top up and the bottom down. How, out of these contradictory elements, to elicit stability is neither an obvious nor an easy investigation, for it is certain that the upward pressure of water on the bottom of a ship, instead of being a cause of stability, is a powerful agent of instability, and that the greater it is in quantity, and the more effectual in power, the more it tends to upset the floating body, and this truth must be thoroughly mastered by the naval architect.

Stability and steadiness do not always go together in a ship; in fact, they are sometimes quite opposite qualities. Stability must be present to secure steadiness, yet a ship may have a large amount of stability, and notwithstanding, in fact because of, extra stability, may be a very unsteady ship.

It will not be possible for me to take you into all the problems involved in securing, under all conditions, the proper amount of stability for a given ship, as that usually forms the subject for a whole session in a college of naval architecture.

In short, the stability of any ship under any condition

of load depends upon the relative position to each other of two points; the one is the center of movement of the mass, and the other is the center of weight of the mass. The naval architect calls one the metacenter, and the other the center of gravity. And he expresses the stability of his ship by the sign of an M above a G, and the amount of it he expresses in feet and inches.

The metacenter is the point around which the ship moves in rolling. There is, of course, also a longitudinal metacenter, the center of motion in pitching, but it has nothing to do with stability. It is the transverse metacenter that we must be most careful about. The naval architect finds it by taking the center of buoyancy of all the sections he has made of his ship at a given draught of water, and therefrom finding a mean center of buoyancy. The metacenter will always lie in a longitudinal vertical plane, bisecting the ship, and on any inclination will be on that plane virtually over the mean center of buoyancy. It is where the line of upward pressure passes through the vertical plane of the ship as stated, and its power is obtained by dividing the moment of inertia of the water plane relative to the middle of the ship by the volume of displacement.

This of course you cannot understand from what I have stated, unless you have made it the subject of extended study, and for the present you will have to take my word for it.

The commander of a ship may not know how to find this important point in his ship, but the way she behaves herself at sea will soon enable him to determine whether it is in the right place or not.

Then the center of gravity must be carefully determined, both for the ship and her contents, by the designer, and to do this he draws a line under the keel, and this he calls the base line, and, having found the metacenter, he notes it as so many feet and inches above the base line.

Now he begins a series of computations in regard to the

weight of every part of the ship, and whatever she has to carry under the conditions he is figuring her for. Nothing must be left out. He also finds the center of gravity of every piece, and its height above the base line. He expresses the weight of every piece in tons, and its height above the base line in feet. He multiplies these two factors by each other, and expresses the result in foot tons; and this is termed the moment of leverage of that particular piece.

Having thus determined the weight and leverage of every part of the ship, and whatever she is to carry, the total moment or foot tons divided by the displacement or foundation weight will give you the height of the center of gravity above the base line.

You may not understand this, and for my present purpose it may not be necessary, but the naval architect must understand it very thoroughly, or the result might be very serious indeed.

The stability, then, of any ship depends upon how much M is above G in her design. If they were both in one place there would be no initial stability, and the ship would just remain in any position that she might accidentally get into. And if G were above M she would turn bottom side up.

This initial stability is an inherent quality in the design of the ship. It may be modified after the ship is built by placing weights below if G is too high, or by placing weights above it if it is too low. But this always reflects on the skill of the designer.

Through ignorance of the laws that govern the stability of a ship, those in charge of her often stow weights on board in such a position as to endanger her stability. A ship may have a large amount of initial stability, and yet be very unsteady at sea.

If the ship were intended for river or harbor navigation, and would never encounter rough weather, then the more stability the better. But when amid waves, if the metacenter be too far above the center of gravity, the tendency

to assume an upright position may be too great, and violent rolling may be the result.

The naval architect must therefore test the design for the ship he proposes to build to see if her righting moment is sufficient and not too great.

The change of form at the water plane or surface of the water as she heels to either side is the great factor in determining this quality of a ship. He finds that when he heels or inclines the various sections of his design relative to the normal water plane, that on the one side a wedge-shaped piece goes down into the water, while another wedge-shaped piece comes out of the water on the other side. These two wedges are called the wedge of immersion and the wedge of emersion. Now if these two wedges were both alike, the ship when thrown out of the upright position by the waves would not come back again. But if the wedge that goes in is greater than the wedge that comes out, the difference is called the righting moment or power of shoulder, and if this is very great, the ship, when thrown out of the upright position by waves, would come back too quickly and would have an unsteady and violent rolling motion in a sea way. So the skillful architect will modify his sections about the normal water-line, so that the wedge going in will not be too much in excess of that coming out, and thus secure easy motion in rough water.

This question of steadiness receives careful attention in the designs for a war ship, because the weights to be carried are all known, and their positions fixed in the design. The water-line is also known, and changes only with the consumption of fuel and stores.

But in a merchant ship the designer has not so full control over the quality of steadiness, as a great range must be provided for in the position of the water-line, and consequently much of the steadiness at sea of such a ship depends upon a proper distribution of the cargo.

Along with initial stability and steadiness in rough water, the naval architect must so design his ship as to

secure great range of stability; that is, he must maintain a righting moment sufficient to bring his ship back again, should she by some unusual force or combination of forces be forced far out of the upright position, and he generally constructs a curve or diagram that shows how far his ship can roll and yet retain the power to recover her normal position. This is called her range of stability.

These are only some of the questions pertaining to the hydraulic and statical qualities that a ship must possess to be successful. Many compromises must be made amongst the contending forces by the skillful designer to get the best mean good result possible. Knowledge must go with skill and experience in solving the many problems involved in the production of a modern ship.

I have tried as briefly as possible to explain how a ship is made to float and carry a cargo; how she is made to stand upright; and how she is made steady. To serve the purpose for which she is designed, that of moving herself and cargo from one port to another with more or less speed according to her design, the naval architect must determine the power that will be necessary to produce the desired result.

Is there any reason why one ship should be more easily pushed, or pulled, or drawn, or driven through the water than another? The weight of a ship being water-borne is not an impediment to speed; but weight is in the case of a ship inevitably joined to bulk. Every ton of a ship's weight occupies thirty-five cube feet of room in the water. To drive a heavier ship through the water is therefore to drive a bulkier ship. It is easy to fancy that in making room for a larger ship we may have more work to do than in making room for a smaller one; but on further consideration it will not seem quite certain that the mere change of place should require expenditure of force. Once in the water and occupying a certain bulk or room in the water, why should there be anything to prevent the ship changing her place except the mere momentum required to start her?

There is no reason why she should not occupy one space in the water as well as another, unless there be something in the nature of the water itself to hinder her. If the water have no objection to make room for the ship to move, there is no reason why the ship should not change her place. But it was early discovered that the water does offer a very decided opposition to a ship's change of place; and in order to measure that opposition the naval architect must understand the way of a ship through the water.

A ship floats by being entirely supported by the water pressing it equally on all sides, and not more one way than another, and, these pressures being all balanced, the ship stands still.

If I want this ship to move ahead, I must do one of two things; either open up a passage that way, by making a hole in the water into which the ship may go, or push the ship so hard from behind that she herself may form the instrument for pushing the water out of her way.

This seems very simple, but it involves the most intricate problems in naval architecture; for, whether it be by scooping before or pushing behind, the water occupying the place to which the ship is going must be removed. If it were possible to dig out a trench in the water and keep it clear, the ship would go on, having only the resistance due to the friction of the water on her skin, or what is called skin resistance. But the ship must dig its own trench, and the difficulty is to know what to do with the stuff that has to be removed. The ship cannot advance a foot without taking out a foot of stuff for every sectional foot of the passage required. How is the ship to dispose of this stuff, where is it to lay it? That is the difficulty, for herein lies the cause of the main part of the resistance the ship experiences.

It would be impossible for me to go into the problems that confront the naval architect in his efforts to find a form of least resistance for his ship that will leave him the necessary bulk to carry the ship and her cargo on dimensions that will be the most economical to build. At present the

law of comparison based on tank experiments with models of various forms, coupled with his experience based on the performance of actual ships, is what he depends upon to guide him in new designs.

Briefly, the water resists because it cannot get out of the way of the ship; for where it is not pressed by the ship it is on all sides pressed by other water as hard pressed as itself. It cannot escape downwards, for that is full of water, and so it is heaped up in front of the ship, and it is this head of water in front that is at once the cause and measure of resistance. This resistance to the progress of the ship has been carefully measured. If the ship were square ended, it is accurately known. The height of this piled-up water depends on the speed, and is proportional, not to the speed only, but to the square of the speed. At a speed of 8 feet per second it would be 12 inches high, and its resistance would be 64 pounds on each square foot of the ship's section.

It may be taken as one of the best-established laws of mechanics that the direct head resistance of water to a flat-fronted body making way through it is measured by the weight of the head of water raised above the level of still water, and that this weight is 64 pounds in salt water at a speed of 8 feet per second. But the height of this head of water or bow-wave varies as the square of the speed, being 1 foot at 8 feet per second, 4 feet at 16 feet, 9 feet at 24 feet, and 16 feet at 32 feet per second, or 20 miles per hour.

Speed, therefore, is an element in the resistance of a ship as well as size, and how to open up a passage for the ship without raising the water as high in front as the speed with a square end would do, is the problem set before the naval architect. If the science dealing with fluid resistance could furnish him with a true measure of resistance for every conceivable form between a square end and the finest wave-line, he could not miss that of least resistance for the bulk he wants to drive through the water at a given

speed. Much has been written on this subject, yet we are still testing varied forms. The reducing of one form of resistance often increases another form, and then least resistance must always be coupled with other conditions of load-carrying power. This has led to increasing the dimension of length as compared with cross-section, thereby increasing the power to carry without increasing the end resistance, the opposition to end motion being increased only by that due to skin resistance.

The great problem of getting a great ship easily through the water, in its simplest form, is this: How can I remove the water which lies on a ship's way, out of it? How can I remove it fastest? How slowest? How with the least force? How can I remove just as much as is necessary, and no more? Where shall I put it so as to lie most completely out of the way? And how shall I economize the movement so that not a particle is carried further than is necessary? In short, how can I do this work without wasting any of the power, either of steam or wind, that I use to propel my ship?

There is a great field yet left for future naval architects to explore. Many able men are at work on the problems involved in how to give a ship that form which may be pushed along the surface of the water fastest, with least expenditure of power, or, rather, with no waste of power. Men have been seeking to discover a solid form of least resistance. This phrase expresses the conviction in the minds of those who use it that there is some shape of ship, some form of solid body, which when afloat would not be opposed by the water so much as some other forms. Which also means that there is for water an easiest way of moving or being moved.

These questions lie at the root of the science of shipbuilding. I have only been able to hint at some of the main problems that confront the naval architect in this lecture. Much is being done in these days towards a more extended and accurate knowledge in regard to them. All

seaboard states aiming to become shipbuilding centers will have to provide the means for their sons to acquire this knowledge, in order properly to equip them for working out further advances in this great science.

For this State, bordered as it is by that ocean which, unless all indications fail, is to be the stage of vast developments in ocean-borne commerce, no provision for instruction in science that can immediately be applied to the development of a great industry is more needed now than a college of naval architecture.

If I have been fortunate enough to interest my hearers to-day in this study, I shall consider this afternoon well spent, and hope that in presenting in my next lecture something on the art by which the shipbuilder puts into shipshape form the design of the naval architect, I may be fortunate enough to increase your interest in a subject that must in the future be one of the branches taught in our State University.

II.

In a former lecture I tried to show you some of the great problems that the naval architect had to solve in the design of a ship that would meet the requirements that he had in mind when preparing his design. We were able only to glance at the most important factors in ship design. How these factors were applied in special cases, and the many conflicting elements that of necessity enter into every design for a ship, even of the most simple type, were matters that the small compass of one lecture would not permit our even naming.

Yet I trust that what was then said may have led some of those who listened to me into further thought on the science of shipbuilding, as the subject presents a vast field of inquiry for the student that will richly reward the right kind of study.

In this lecture I desire to say something on the shipbuilder's art, as distinguished from the science of shipbuilding.

The work of the shipbuilder is divided from that of the naval architect by the same line which separates the profession of the civil architect from that of the constructor of the building. The one has to do with the original intention, invention, and inspiration; the other has to do with giving the design practical form, the assemblage of fitting materials, the process of giving them proper shape, and the details of putting them in place and securing them there.

The science of shipbuilding requires calculation and headwork as its business, as distinguished from the handiwork, which requires mainly skill in the use of tools, but which, nevertheless, cannot dispense with headwork.

The naval architect must do his work before the shipbuilder begins his. He has settled, fixed, and measured all uses and purposes of the ship; he has balanced the opposing forces against each other; he has decided to what extent each desired purpose shall be effected, and each desire on the part of the owner fulfilled. He has, in fact, laid down "the law" of the ship. He also shows in his design how "the law" is to be executed. The ship is meant to be so fast, and therefore must be of this length. She is to be so roomy, and therefore must be so deep. She is to have so much stability, and therefore must be so wide. She is to carry heavy weights, she must therefore have a high box coefficient. She must be easy and seaworthy, and therefore so shaped. She will have heavy cargo one way and light the other, so she must have water ballast. She must be with all sightly and convenient, and so must have a graceful outline. If a sailing ship, she must be weatherly, and must therefore have so much hold of the water, must be of a certain rig, must carry certain sails which must balance well, and she must carry them bravely in all weathers.

All this the naval architect must lay down in law, and also in lines—lines so exact and well thought out that any deviation therefrom would detract from the character of the ship.

All these wise provisions of the naval architect it is the business of the shipbuilder truly and faithfully to execute. As in the naval architect the highest quality is science and judgment to apply it, so in the shipbuilder the highest quality is craft and skill, and if combined in one person, so much the better will the result be. The builder has to deal, not with thought, but with matter; not with opinion, but with weight and strength. He has not to battle with figures and calculations, but to wrestle with rough, strong, obstinate matter; to twist and mould, and hammer and hew to his mind; and that which the naval architect had to do on paper, he has to do in steel or iron and wood.

The business of the shipbuilder is multifarious, far spread, and heterogeneous, and he must set about it in this wise: having studied out what sort of a ship it is to be, his first duty is to find the materials out of which the ship is to be built.

In by-gone days when ships were built of wood, and still where that material is used, he himself would go on toilsome journeys into the oak forests, and there with the forester select the timber fittest for his purpose, have it felled, and in due time brought home to his yard. In order to do this wisely it was no mean part of his skill to carry about with him in his head the various shapes and curves required for every timber in a ship; and to fit these into the live trees with his experienced eye was no mean achievement of craft and skill.

I have, when a boy, gone to the woods with my father, who had considerable skill in buying standing timber, not only for his own yard, but for other yards that would get him to buy for them also. "Here," he would say, "mark this oak. That is a stem; its crooked neighbors would go with it for a forefoot; yonder straight one will be a grand stern post; here are four fine elms for the keel, and these others will plank the bottom. Here is a fine lot of oaks for floors, and that lot of crooks will come in for first and and second foottocks." And so he would go on through all

the requirements for framing a ship of the old time; and on the skill of the builder in those days in this respect, much of the durability of his work, his own profit or loss, advantage or ruin, naturally depended. Skill to know good from bad; skill to select quality of timber; that was a first requisite in a builder of my father's time.

Since the time when I went to the forest with my father selecting timbers for the Baltic traders he built, a revolution has taken place, from the natural, traditional, and universal practice of building ships out of wood taken from the trees of the forest, to building them of metal dug from the bowels of the earth. To build ships of wood seems natural, and therefore right. But to build ships of iron or steel was in the nature of things preposterous, unnatural, and absurd. "I'll never build an iron ship; it's against nature," was an expression often used by my father; and he never did.

The real difficulty was, not how to make iron float and carry weights, but how to build it strong enough to endure the straining and racking due to heavy seas. Any tinker could build an iron vessel thin enough to swim; but it was soon discovered that special skill was required to make it strong and durable. The first ships built of iron taught the lesson that it was easy to make iron ships to swim and carry, and that it was only hard to make them strong and seaworthy. The first experiments in iron shipbuilding enabled the builders to discover that there was much more to learn than merely making an iron box, shaped like a ship, thin enough to float, and large enough to carry.

It soon became obvious that the problem of building good iron or steel ships was one of a much higher order: that it required skill in the nature of iron; skill in the strains to which such structures are subject; skill in the shapes which make iron or steel capable of bearing one strain or another; skill in the properties of the various parts or members of the structure, so that they may best combine to help one another in bearing the strain; skill in

the methods of fastening one piece of iron or steel to another, so that the means of fastening shall give strength instead of diminishing it. And then most careful study was necessary of all the compound strains, which in a heavy sea test the structure and threaten its destruction. For this complicated structure of iron or steel may have its two ends supported on two waves, and the middle left comparatively without support; while on the contrary, it may be hung up in the middle by a single wave, leaving its two ends in the air, with all the variations possible to these hogging or sagging strains, and applied at all angles.

These were conditions in which it was supposed that the timbers of a wooden ship would have much more flexibility than the material of an iron or steel one, and that by yielding it would give and take a strain much more kindly. So the general safety of a large iron or steel ship in a storm appeared to present an entirely new form of mechanical problem, requiring for its solution a kind of skill, both high in degree and comparatively rare.

At first the skill required for the proper design of an iron or steel ship was a rare thing, because of the total want of precedent for iron structures and sea-going ships. At first the wooden shipbuilder was depended upon for the proper proportions of the parts in iron ships. Unluckily, the wooden shipbuilder as a rule hated iron ships, and but little help came from that quarter. Those who did try knew little or nothing of working iron plates and shapes, or the right strength or proportions to give them or the right way to fashion them.

The men who did know something of the qualities and properties of iron and how to shape it, belonged to quite another race, occupied in thinking of quite other things. The smith and carpenter had little knowledge in common between them. There was also a race of iron boilermakers, who were known to understand how plates of iron could be cut and bent and shaped, and joined to one another. There was therefore some help in the way of workmanship that

came from them, but as to general design, large mechanical principles and skill, enlightened by science, there was no race except the civil and mechanical engineers who had acquired much skill in using iron, and from them a considerable amount of skill of the right sort was available when the necessities of iron shipbuilding required it. Thus the new art and science of building ships in iron and steel was worked out mainly by mechanical engineers.

Thus it came about that iron shipbuilding was taken up principally by engineers who made one part of their business the manufacture of marine engines to drive ships, and the other part the manufacture of the iron ships they were to drive. In this natural way it came about also that iron ships and their engines came to be designed by one and the same person, and this was found so convenient that at the present day most iron shipbuilders build their own engines and many engineers build their own ships.

There is also another point which more clearly identifies iron or steel shipbuilding with engineering than wooden shipbuilding, namely, that the machinery, plant, and establishment required for the building of iron or steel ships are very much the same as those required for engineering, the materials used being nearly the same also. It is necessary, therefore, for the iron or steel shipbuilder to be skilled, not only in the quality and uses of the material he works with, but also in the employment and application of all the engines and machinery which are required to work it into the shape of a ship. He must work with presses to produce complicated shapes; rolls to form part of curves; rolls to straighten; planing machines to edge and butt his plates; beveling machines to open or close his angles for frames; scarping machines, punching and shearing machines, drilling machines, furnaces, and all the bending tools that go with them. And now a large proportion of the riveting is done by machine. The modern shipbuilder, therefore, will do well to fortify himself by an apprenticeship in an engineering works. If he has gone through a course of training

in wooden shipbuilding, so much the better, for there is still much to be done common to both.

To sum up the kind of training necessary to form a complete and well-equipped modern shipbuilder, I venture to suggest that he should first make himself by study a good mathematician, a good mechanic, and a good theoretical naval architect. Next, that he should serve some part of his time as apprentice to a mechanical engineer. Next, that he should study the nature, manufacture, qualities, and prices of materials used in shipbuilding; and while he is doing all this, that he should practically go through with his own hands every part of the process of the construction and equipment of a modern ship. When he has done all this, he is ready to start in to do his life work of learning to be a shipbuilder.

It would not be possible within the limits of one lecture to go very far into the art of shipbuilding.

When the naval architect has determined all the characteristics of the ship to be built, and computed the strength of materials that will be required to make her seaworthy and to entitle her to the highest class at Lloyds, or any other of the classification societies in which she is to be rated, a half model of the ship is prepared from the lines. This is usually on a scale of $\frac{1}{4}$-inch to the foot, or one-forty-eighth of the full size. On this half-model all the framing and all the plating is lined off, and as soon as this is ready the material orders are got out. Besides the model, framing and plating plans are prepared for all the interior work; the inner bottom, if she is to have water ballast; and all the decks and bulkheads. An expansion plan is also made from the model of the outside plating, which represents the outer skin rolled out flat. This gives the shape of every plate.

The specifications for the material are got out in the sequence in which the material is required by the shipbuilder, and every plate and bar has a designating mark and number by which it is identified when received into the

yard for use. It is of the first importance to get these material orders off to the mills promptly, as the possibility of getting the ship ready on contract time depends largely on this preliminary work.

When the material orders are off, the design for the ship can be expanded for practical work in the yard. This may be done by the naval architect or the master builder; in fact, they are often the same person. This operation brings us to the geometry of shipbuilding, and this in many respects for iron shipbuilding is identical with that for wood shipbuilding, for there are frames of steel and planks of steel crossing each other, as frames of wood and planks of wood cross each other in a wooden ship. So there is little difference between laying down an iron or steel ship on the floor, and taking it off in moulds, and the same process in wood.

The small scale plans prepared in the draughting-room must be reproduced full size on a wooden platform or floor for the cross sections, or what is called the body plan. This floor must be somewhat larger than the section of the vessel. If the proposed ship was to be 50 feet beam and 35 feet deep, the floor for the body plan should be about 60 feet by 45. This floor is usually made of clear pine, and about 4 inches thick, the planks being say 4 inches square, and secured together by edge fastening, so that the surface will have no nail holes. When this is dressed off and coated with black, it is ready for use. In a large yard this floor is large enough to take the body plan for several ships at the same time. The lines are cut in with a scrieve, making a score about $\frac{1}{8}$-inch wide and $\frac{1}{8}$-inch deep, so that for each new ship laid down on this floor $\frac{1}{8}$-inch must be planed off to take out the old lines. When the body plan is laid down it shows in transverse section at right angles to the keel the leading edge of each frame. From this leading edge each frame will have a bevel, determined by the level line at that point. The iron planks or plates will in like manner have to follow certain ribband lines drawn as nearly as may

be square to the ribs they cross. All longitudinal framing and bulkheads, with deck beams and stringers, are also laid off on this body plan.

On this full sized plan the frame-setter bends his mould strip and transfers the shape of each frame separately to the iron floor on which the hot frames from the furnace are set. This full sized plan must be preserved while the ship is in progress, as every part of the structure must conform to the shape laid down for it there.

There is a difference, however, between the laying down of an iron or steel ship and a wooden ship, and it is in the relationship between frame and skin. So the laying down and taking off of an iron ship requires to be set about in quite a different way from that of a wooden ship. In the wooden ship the geometrical problem is, from a given design to construct the moulds of all the parts of the frame work. In the iron or steel ship, the geometrical problem is, from a given design to construct the forms of all the parts of a skin, so that the skin has first to be designed, and the frames follow. In a wooden ship, when the frame is completed the planking is laid on to the frame and takes its shape from the frame, bending either on the flat or edge, or having a combined bend and twist in both directions. But as with iron or steel plating there can be no edge bending, each plate must have its proper form to suit its place on the skin of the vessel. So that from the model an expansion plan of all the plating must be made in order to get the proper shape of each plate.

The best illustration of what has to be done in designing the skin of an iron or steel ship is what the tailor has to do when he cuts out a tight-fitting dress coat. The cloth as it lies shaped out on the tailor's cutting board bears as little resemblance as possible to the coat as it sits around the chest of his well-fitted customer. The tailor's is a highly geometrical art, and a perfect-fitting coat is sufficiently difficult to produce for fortunes to be made by knowing how to do it. The iron shipbuilder's art is the

cutting out of the tailor on a grand scale, but to understand how much more difficult it is we must conceive the tailor asked to manufacture a perfectly fitting dress coat out of square goods of steel plate!

To design the frame, but especially the skin of a steel ship, is a problem requiring the highest geometrical training and skill. By that I mean the doing it quickly and truly, so as to do it strongly and reliably. A badly built steel ship with material forced into unnatural shapes, is far less valuable as a property, and far more dangerous as a conveyance, and less trustworthy, than a well-built wooden one. For under severe stress the wooden ship will groan and complain, and show signs of weakness long before danger arrives; and will bend with the waves and struggle with them long before giving way. But the struggle and the failure of a badly built steel ship comes without warning.

Besides giving every bar and every plate its proper shape, there must be such a skilled uniting of every part as to make the completed structure possess the greatest strength possible. The pitch and size of rivets must be in the proper ratio to the section of material they unite, and riveting for watertightness or for structural strength must be carefully considered; skill in laying off the rivet holes, and in transferring the position of holes in one plate to another, so that the holes will be fair when the plates come together, must be possessed; where hand riveting is necessary and where machine riveting can be adopted, both for economy in cost and durability of result, must be considered.

The shipbuilder must also exercise great skill in the handling of material, for herein lies the chance for economical production in the shipyard. Mechanical means for handling the material must be employed nowadays at every stage in the operations; and the arrangement of tools should be such that the material should keep steadily moving in the direction of its final location on the ship as it goes through the various manipulations required.

While the main structure, consisting of the frame work,

the skin, the bulkheads, and decks, is being worked into the form of the ship that has been designed, the shipbuilder must at the same time carry on other important matters. If it is a steamship that he is building, the engine seatings, the boiler seatings; arrangements for the shaft coming through the stern work to receive the screw propellers, and a well in which it works, must be provided. Or, if is to be a side-wheel ship, main bearing supports and paddle beams must be worked into the structure of the ship. Arrangements must also be made for taking in sea water to the condenser and discharging it overboard when it has done its work. A shaft tunnel must be constructed through which the shaft passes to the stern. All the needs of the engineer must be anticipated, and provision made properly to secure all his work. Then, if it is a passenger ship, living accommodations of the most elaborate description may have to be arranged for, and all the joiner work, plumber work, painting work, upholstery work, tiling, and decorative work of every description must be got ready for its place by the time the hull work of the ship is complete.

But when the hull has really become a ship in form and strength, so long as she remains on dry land, she is no ship; and it is the finishing stroke of the skill of the shipbuilder to place her safely in the water. The transference of so great a weight as two, three, or six thousand tons out of the building yard into the sea, appears at first sight an arduous and difficult problem, but with sufficient foresight and forethought it becomes so easy as to be little more than routine. Where these are wanting it may be extremely difficult or next to impossible. Ships have stuck half way on their way to the sea, and broken their backs, and required as much repair as if they had suffered shipwreck.

Where I was brought up there was about twenty-four feet rise and fall of tide, and a stuck launch was a disaster indeed. I remember an iron ship having been left, by an imperfect launch, with her bow on the edge of the building yard and her stern on the bottom, with her middle in the

air, and serving as a notable example of the strength of an iron ship.

Another danger is that the ship may stubbornly refuse launching, and choose to stay on land. It also sometimes happens that, after refusing to go when wanted, the ship launches herself at an improper time. There was a case of a large battleship launched some years ago on the Clyde, Scotland, when the ship started to slide down and continued to slide, but so slowly that it took several hours to reach the water, and then, when the water had fallen so far that the ship was considerably damaged by leaving the ways without sufficient water at the foot of the ways to float her.

Against all such casualties it is the object of wise launching arrangements to provide. First, the launch ought to take place with certainty at the exact time wanted. Second, it must take place easily and with a moderate speed. Third, provision must be made against straining.

These are the ordinary conditions to be foreseen, but there are sometimes others. The water may be shallow, or there may be very little room for the length of the ship, or she may have very far to go to meet the water, and for such special cases peculiar provisions are required. The ship may be launched equally well, so far as launching is concerned, with head foremost, stern foremost, or broadside on, or at any required angle of obliquity to the keel, provided the following condition is observed: the ship must remain thoroughly well land-borne until she becomes thoroughly well water-borne. This is the first difficulty, and easiest overcome in the usual type of ship, by launching stern first. While the ship is being built she is well supported by the long rows of blocks on which her keel rests from end to end. These carry nearly her whole weight. In addition, she is kept upright by a line of bilge blocks on each side, and by shores outside of them all around, which prevent her from swaying to either side. In this condition the ship is finished, and is perfectly

land-borne, but before she can be launched all these supports must be removed. The first step toward launching, then, is to provide a new and different arrangement of supports, entirely independent of those upon which she has been built, but which must support her for a little while, as perfectly as they have done for a long while. In the usual mode of launching this is accomplished by laying down on each side of the center line of blocks two independent lines of supports for which a proper foundation is provided in the plan of the yard. These lines of supports consist of two parts, the upper being the cradle and the lower the ways of the launch. These are extended from near the bow, a long way down into the water, while the cradle extends no further than the ship herself.

The ways form a kind of railroad to carry the ship into the water; they are laid perfectly smooth, even, parallel, and continuous down the slip into the water; but, as they have a heavy load to carry, and may have great pressure to endure, they must be laid on a good foundation, and must be kept in perfect alignment.

Where we launch here, over mud at the foot of the slip, a large platform of plank is made and sunk on the mud, the lower end of the ways being laid on this platform, and for very heavy ships piles are driven close together out as far as the ways have to extend, and cut off at the proper depth below the surface of the water to receive the ways. Great precaution must be taken to have all this work true to line, and built strong and sound. This is the first provision for safe launching.

The second provision is to lay the ways at the right slope downwards. This is a matter of critical importance. If the slope be too small, the ship will refuse to move; if too great, she will attain a dangerous speed, and may enter the water at such an angle that she cannot be water-borne, and may come to a stop like the ship I referred to with one end fast on the slip and the other on the ground, subject to the falling tide. One-half inch inclination to every foot would

produce a dangerously slow movement; in fact, the ship would have to be assisted. Five-eighths of an inch to every foot will produce a very easy launch if the ways have not too much surface in proportion to the weight. Three-fourths inch to the foot is the inclination usually adopted, if there is no other circumstance requiring something different. From what I have said about angle of launch it will be readily seen that the choice of the place on which the ship is to be built, and the height at which she stands above the water, must all be carefully foreseen when the keel is laid on the blocks.

Another point that the shipbuilder must be careful about is the amount of surface that he provides on the ways. This is determined by the launching weight of the ship. The most successful practice would indicate between two and three tons to the square foot of surface. This is lubricated with the well-known shipbuilder's mixture of tallow and soft soap. First hard tallow is applied hot to the surface of the ways, so as to form a perfectly uniform coating; then plenty of the soft soap is applied as the lubricant.

To prevent any side movement of the ship during launching, a ribband or flange of stout planking is bolted to the inside edge of the cradle or sliding ways, leaving a clearance of about one-half inch. This serves the same purpose to the ship that the flange on the wheel serves to a locomotive engine, it prevents it from leaving the track.

I have mentioned the cradle that forms the carriage on which the ship glides along the ways. This is formed, as stated, of two upper ways which form the base of the cradle. On this base we place blocks to fit exactly under the ship, filling the space between her skin and the upper or sliding ways. The quantity of this blocking depends upon the shape of the ship, and there is often difficulty in properly carrying the weight of the ship to the sliding ways, especially near the ends. So a critical point with the shipbuilder is to decide how long he can make his cradle,

and give each part its proportion of the load. This cradle must fit the form of the ship exactly, and underneath every block on the cradle a wedge-piece is carefully fitted; in a large ship there are hundreds of them. But before allowing the ship to rest on the cradle and the greased ways, many precautions are necessary to prevent from moving before the intended time, and to insure her going when the proper time comes.

The most important of these contrivances are called the "dog-shores." They are the last impediments to the motion of the ship, and are removed only at the instant of launch. The dog-shore is usually a stout strut of oak with an iron shoe on each end. A strong stop is bolted on the ways to receive the heel, and a similar stop is bolted on the cradle to receive the head of the dog-shores, so that the cradle could not slide without first crushing the dog-shore to pieces. There is one of these on each side of the ship, sometimes two. They lie nearly horizontal, and as long as there is no pressure on them they would fall out of their places, except that a small prop is fitted under them to support their weight. This is called a "trigger." At the last moment, when all other supports have been removed, there is usually an enormous pressure on the dog-shores; sometimes sufficient to crush them before they are knocked out. Sometimes a heavy weight is suspended over the dog-shores. That is electrically released by the lady that does the launching.

But we are not quite ready for that yet. Other precautions and matters of forethought have to be attended to. The great wooden cradle on which the ship is carried down to the water must be removed at once from under her, for the pressure of the water makes it adhere firmly to the bottom of the vessel. All the pieces forming the cradle are therefore fastened together and to the timbers forming the sliding ways, while by strong ropes the whole is made fast to a firm post in the yard. Enough slack is given this rope as will allow the ship to be clear of the ways and

afloat, when the rope tightens and holds the cradle firmly, while the speed of the ship carries her on and out of the cradle.

If there is not much room at the front of the yard, which is often the case, provision must be made for stopping the ship. At the yard of the Union Iron Works we are to launch a ship next month which is five hundred feet long, while there is only about eleven hundred feet space to receive her. The usual method, and the one we adopt, is to use the anchor chains of the ship, one on each side, and stop the momentum by them. The power required to stop the ship must be all figured out beforehand, and must also be applied in a given space. For instance, if the ship is to be allowed to go three hundred feet after she floats, and she weighs four thousand tons, going at fifteen feet per second, we have fifty-six thousand foot tons to take up, less the resistance of the water to the motion of the ship. The way in which this is done in say three hundred feet is to stopper or secure the chains by ropes of known strength at intervals of say ten feet apart. These all break in succession, about one second apart. There are thirty of them on each side, and the work done in breaking them brings the ship to rest.

Before the launch all the shores and staging is removed, the soft soap applied to the ways and cradle, and all the pieces forming the cradle properly placed and fastened. About two hours before the time for launching the transfer of the ship from the fixed blocking on which she has been built to the cradle that is to carry her to the water begins. A force of men on each side using a battering ram begin at the after end of the cradle and drive home the wedges under the blocking of the cradle. The shipbuilder watches this operation with great care, the object being to get an even pressure by the cradle all along its line on the skin of the ship. After this has been done a large part of the weight of the ship still rests on the original supports. After a few minutes' rest the men again begin at the stern

to remove each alternate block under the keel. This has been provided for months before, by having the block directly under the keel made of straight-grained wood, and short enough to be readily split; so the men split these pieces out with steel wedges. After each alternate block has thus been removed, it can be noticed that the cradle is now taking more load.

Another short rest is given the men, the shipbuilder having carefully timed each operation. Then the final operation begins at the stern again, the removal of the remaining blocks and the bilge blocks. Considerable suppressed excitement now prevails amongst the men, and the shipbuilder may be seen at intervals anxiously watching a line on the cradle to see if she moves. Everything must be removed this time, and from aft forward, and as this proceeds, especially in heavy ships, the desire to go begins to express itself by signs that the shipbuilder well knows. At last every support is out except the dog-shores, and the interesting moment has come. Everything has been foreseen and provided for. Nothing now remains but to baptize the ship and launch her into life.

"All ready?" "All right!" "Out triggers!" "Down dog-shores!" and off she goes on her career of good or evil fortune.

Our ship is now a ship indeed, for as a general rule, and according to some points in law, a ship is not a ship until she floats. She is then baptised, named, and has a body which can be called her own; or, rather, she may then have an owner. She may become a corporation; she can incur debts, make contracts, and conduct law suits. She also may be married to a ship husband, and become initiated into the functions of social, legal, and active corporate existence. She enters into life, property, and action.

When launched she becomes a ship, but she may be a ship in very different degrees of maturity. She may be launched fully equipped for immediate service and ready for sea, or she may be launched bare, naked, and destitute of

anything required to fit her for the active duties of life. She may be a ship and nothing more, or she may be a ship wanting nothing. And there is a wide difference between the one and the other. Most ships are now fully completed and equipped by the shipbuilder.

The battleship Wisconsin, just completed at the Union Iron Works, was completely equipped by the builders, the armor plates and the guns being supplied by the Government to the builders to be fitted in place by them. So that at the shipbuilders' yard she went into commission ready to do battle for her country.

Merchant ships are also, as a rule, fitted out complete by the builder. In merchant ships carrying large numbers of passengers, the fitting out complete becomes an elaborate business, bringing into service nearly every known craft. Combined with the skill to build a staunch and seaworthy ship there must be the skill to make her a comfortable place to live in, with every modern luxury, perfect sanitation, perfect ventilation, perfect table service, and attendance to every want. How to bring all this into existence and work it into harmonious relationship with the structure of the ship he builds, is the art of the shipbuilder. With scientific knowledge must be combined a cultivated taste, and a breadth of culture that a thorough education alone can impart.

I have not touched in these lectures the subject of marine engineering, which cannot be separated from shipbuilding, for the shipbuilder must know much about the marine engine, it being his great instrument of propulsion; and the marine engineer must know much about the ships that his engines are to propel.

So I trust to see some day in the not too far distant future, conspicuous among the great halls of learning to be reared here, two noble buildings, one for the study of naval architecture, the other for the study of marine engineering, and between them an experimental tank second to none in the world, where the forms of great steamships to carry a

mighty commerce between the newest and the oldest civilizations on earth will be evolved and brought to such a degree of perfection as will enable our ships to command the trade of the Pacific. This is California's opportunity if we could only get her people to realize it, and set to work before it is too late.

THE ASSOCIATION OF AMERICAN UNIVERSITIES.

HISTORICAL NOTE.

On the twenty-fifth of March, 1898, the Graduate Council of the University of California appointed a committee to consider the advisability of conferring with other universities upon certain important matters of common interest, specifically the status of American students in foreign universities. While this committee was engaged in its work a letter was received from the President of the Federation of Graduate Clubs soliciting suggestions concerning the work of the Federation. The resulting correspondence made it evident that the problems, such as migration, with which the Federation was then struggling, depended so much on the attitude of the leading American universities towards one another, that a solution could only be hoped for through joint deliberation of the universities; and in its report of February 24, 1899, the committee recommended that conference be had with a few of the greater universities, not only on the original question, "the status of American students in foreign universities," but also on the standards for higher degrees, and other matters of common interest.

The effective outcome of these deliberations was a letter addressed to the Presidents of Harvard University, Columbia University, Johns Hopkins University, and The University of Chicago, inviting their coöperation in the issuance of a

call for an early conference of representatives from a suitable number of the greater universities. Favorable replies to this letter having been received, the call was issued under date of January, 1900, and was signed by the Presidents of Harvard University, Columbia University, Johns Hopkins University, The University of Chicago, and the University of California.

The invitation to the conference was extended to the following institutions: University of California, Catholic University of America, The University of Chicago, Clark University, Columbia University, Cornell University, Harvard University, Johns Hopkins University, University of Michigan, University of Pennsylvania, Princeton University, Leland Stanford Junior University, University of Wisconsin, Yale University.

All of these institutions promised coöperation and twelve of them sent delegates to the first conference, which was held on the 27th and 28th of February, 1900.

The report of the delegates from the University of California to the second conference follows.

SECOND ANNUAL MEETING.*

The second annual meeting of the Association of American Universities was held in the city of Chicago, February 26, 27, and 28.

The delegates met for the first time at luncheon in the Quadrangle Club of the University of Chicago, on Tuesday, February 26th, in response to the invitation of President Harper of the University of Chicago. About forty guests were present at the luncheon including the delegates from the different universities, Mr. Frederic Harrison, and Dr. W. T. Harris, the United States Commissioner of Education. The luncheon was informal and was immediately followed by the first session of the conference, which

*Report presented to the Graduate Council, March 11, 1901, by Professors Irving Stringham and Armin O. Leuschner, delegates of the University of California.

was held in the Haskell Assembly Room, University of Chicago. The delegates representing the fourteen universities of the Association were:

The University of California—Professor Irving Stringham, Professor Armin O. Leuschner; The Catholic University of America—Right Rev. Monsignor Conaty, Rector, Rev. Edward A. Pace, Dr. Daniel W. Shea; The University of Chicago—President William R. Harper, Professor Harry Pratt Judson, Professor Rollin D. Salisbury, Professor William Gardner Hale, Professor Starr Willard Cutting; Clark University—President G. Stanley Hall; Columbia University—Professor Nicholas Murray Butler; Cornell University—Professor Thomas F. Crane; Harvard University—Professor LeBaron R. Briggs; Johns Hopkins University—Professor Ira Remsen; The University of Michigan—President James B. Angell; The University of Pennsylvania—Professor William R. Newbold; Princeton University—Professor William F. Magie; Leland Stanford Junior University—Professor John C. Branner, Vice-President; The University of Wisconsin—Professor E. A. Birge, Acting President, Professor Charles Forster Smith; Yale University—President Arthur T. Hadley.

All the delegates were present, except President Hadley, who was called home before the opening of the conference on account of illness in his family.

At the final session of the conference provision was made for the publication of the proceedings of the Association from the date of its organization, and it is therefore deemed unnecessary to present in this report, in addition to the resolutions adopted, more than a brief synopsis of the discussions.

The following business was transacted at the various sessions before and after the discussion of arranged topics, Dean LeBaron R. Briggs of Harvard University presiding: President Harper, for the University of Chicago, secretary, presented a report containing announcements and suggestions for business to be transacted. He announced:

1. That all the universities named in the articles of organization had accepted membership in the Association.

2. That the report of the temporary secretary to the executive committee, not having reached the committee until after its adjournment, had not been acted upon.

The following action was taken:—

1. Votes were passed thanking the Quadrangle Club and the University Club for hospitalities extended to the delegates.

2. Professor Judson (Chicago), Smith (Wisconsin), and Shea (Catholic University), having been appointed a committee to nominate officers for the ensuing year, reported on Wednesday afternoon, and the following officers were elected: President, Columbia University; Vice-President, the University of Michigan; Secretary, the University of Chicago; fourth and fifth members of the executive committee, Harvard University and the University of California.

3. Professor Leuschner (California) was asked to prepare reports of the meetings for publication in the daily papers.

4. In accordance with instructions previously received, the executive committee at the same session submitted a report embodying the following recommendations:

(*a*) To adopt the suggestion of the American Association for the Advancement of Science, presented through Professor Butler of Columbia University, that the universities of the Association join in recommending the setting aside as convocation week for the annual meeting of all learned societies, the week beginning Monday after Christmas day.

(*b*) To defer the election of new members until a definite basis for such elections shall be adopted.

The report was adopted, and on motion of the California delegates, amended by Professor Magie for Princeton University, the following procedure in electing new members was agreed to:

The executive committee shall invite from the univer-

sities representing the Association nominations of new members.

At least one month before each annual meeting such nominations as have been approved by the executive committee shall be communicated to the members of the association. The proper authorities of the universities composing the association shall be requested to instruct their delegates with a vote on each university approved for membership by the executive committee. In accordance with the articles of organization a three-fourths vote will admit to membership.

In the discussion preceding the adoption of this motion Professor Newbold expressed the opinion that the association should at once settle on the qualifications on which new members shall be admitted. He stated that the president of a prominent university had severely criticised the exclusiveness of the Association, and he feared that the postponment of the election of new members might result in the formation of a rival association.

In reply Professor Leuschner said: "The experience which the original five universities have had in selecting the universities which were invited to our first annual meeting convinces me that it would be exceedingly unwise to decide at the present moment on the particular qualifications which will entitle other universities to membership. We certainly do not know whether we shall wish to stand by the policy which we may adopt to-day. It would be far wiser to follow a method similar to that adopted by the original five universities; namely, to admit universities on their general standing rather than on the basis of any stated qualifications. Furthermore, it was provided at our last meeting that, whenever possible, the executive committee should communicate in advance to the members of the Association the names of the universities which are to be voted upon for membership at any meeting, and I doubt very much whether Professor Stringham and I would be willing to cast our vote on any institution which might be

nominated to-day without having been previously instructed with a definite vote by the Graduate Council of the University of California. I therefore hope that the motion will prevail."

A communication from the Federation of Graduate Clubs touching the interests of graduate students, particularly with reference to the awarding of fellowships, was passed over to the executive committee with instructions to make suitable acknowledgment.

At the final session it was voted that the expense of publishing the proceedings of the Association be borne in equal shares by its members.

The place and date of the next meeting are to be determined by the executive committee.

Before final adjournment a vote of thanks was tendered the University of Chicago for courtesies and hospitalities extended to the Association during its second annual meeting.

In a letter addressed to the Association President Eliot asked for an interpretation of the meaning of the words "graduate study" in the following paragraph of the articles of the organization:

"It is founded for the purpose of considering matters of common interest relating to graduate study."

Professor Remsen desired to have the work of the Association restricted to the problems relating to the Philosophical Faculty proper.

President Harper doubted the wisdom of limiting the possibilities of the Association.

Monsignor Conaty asked whether in forming the Association the original five universities had contemplated at some future time the extension of the field now covered by the Association. Professor Leuschner replied as follows:

"There is nothing contained in the correspondence which passed between the original five universities prior to our first conference that would indicate that the work of the Association should be restricted in any way. On the

contrary, we took it for granted that in the course of time the Association might take up any and all problems of higher education, whether they relate to the so-called Philosophical Faculty, so far alone represented in the Association, or to the professional faculties, like medicine and law, or to the engineering faculties. In fact, it will be remembered that at the close of the last session the California delegation submitted among others the following suggestion which, on my own motion, was referred to the executive committee for consideration: 'That the Conference consider itself a general organization having separate sections in all the learned professions, including the technical sciences, and that steps be taken for the organization of such other sections.'

"I may also mention that at the last meeting we received a communication from the American Academy of Medicine requesting information regarding the relation of medical colleges to the undergraduate courses, which communication was also referred to the executive committee."

In accordance with the programme prepared in advance by the executive committee, the topic of the first session was "Migration Among Graduate Students." The discussion was opened with a paper prepared for Johns Hopkins University by Professor Ira Remsen, who spoke in part as follows:

"Migration is on the whole a good thing. In Germany an ideal system exists. A student receiving all his education in the same institution must necessarily be narrow. While a migration of a peculiar character does already exist, it is due largely to dissatisfaction among students and is not prompted by the best motives. Is migration of good students possible, should it be encouraged, and what results may be expected from it? There are many obstacles in its way, among them the loyalty of the graduate student to his alma mater, our system of administering fellowships, the difficulty of receiving full credit or proper status in changing residence, but most of all the

natural disinclination of a professor to send off a good student to another university while we are making every effort to increase the number of our graduate students. Each university is trying to work out the problem for itself. In England and France migration practically does not exist. While the members of the association are probably in favor of the plan of migration, there is little prospect of practical results in this direction."

President G. Stanley Hall of Clark University took issue with the final statement of Professor Remsen, and contended that a great deal of migration is already taking place.

"Many professors tell their students to go to other universities," said President Hall. "Everything possible should be done to encourage migration. If a student would select his university merely from a desire to hear the best men, it would be a stimulus to the professors to turn out their best work. I hope to see the time when it makes no difference whether an eminent man has one student or many in his classes. It is a distinct disadvantage to a professor to have too many fellowships at his disposal; quality of work, rather than money, should count in attracting students. It would be well to offer fellowships to enable graduate students to go to other universities."

President Harper of the University of Chicago said that men were being urged every week to go from Chicago to other institutions, where they could specialize to better advantage on certain lines. "If we should put down all that we have in common," said Dr. Harper, "we should be surprised at the uniformity of conditions, and how easy it is for students to change from one graduate school to another. That the plan of sending students away works well is shown from the fact that three students whom we sent away, have recently received appointments in other institutions. A student will be narrow if all his work is done in one place. It is not so much a question of loyalty as convenience.

"It is easier for a student to continue in a university in which he knows the regulations and in which he is acquainted. During the first two years most of our graduate students came from Harvard University, then from Michigan. One-third of our graduate students of the present year have studied elsewhere; so have, also, most of our undergraduate students. Fellowships do not hinder migration."

Professor Butler remarked: "Facts will justify my impression that Professor Remsen has greatly magnified the existing difficulties. In my own department I have had in ten years 417 graduate students of whom ten per cent. had taken work elsewhere. Out of twenty-one who have taken the degree of Doctor of Philosophy under me, only four took all their work at Columbia University. On the whole these four were not the strongest men. Migration is now going on vigorously, and most of our fellowships go to outsiders. Letters are constantly received from other universities asking us to continue with some of their graduate students, and *vice versa*. We have just written to Professor Howison of the University of California, asking him to take one of our men. There is no such thing as graduate school loyalty. Serious co-operation rather than regulation is necessary. Not every department in a university can be maintained at the highest efficiency. At Columbia we insist on competence for the doctor's degree, but we do not insist that it can be had in only one way. Migration is largely dependent on the attitude of the universities towards one another."

Professor Newbold of the University of Pennsylvania endorsed Professor Butler's remarks: "We advise students to go to other universities. Fellowships work both in favor and against migration. A notion prevails with the graduate student that he must take his degree where he holds his fellowship."

Professor Crane of Cornell University confirmed Professor Butler's remarks: "The amount of migration is

very much larger than Professor Remsen seems to think. Graduate students constantly come and go at Cornell University. Our fellowships are frequently used to enable students to study elsewhere, especially abroad. Credits and status of students coming from other universities are easily arranged for."

Professor Smith of Wisconsin University stated that fifty per cent. of their graduate students come from other universities.

Professor Stringham of the University of California said:

"The conditions in California are favorable to migration, both graduate and undergraduate. Hitherto we have sent more graduate students to other institutions than we have drawn to ourselves, but at the present moment undergraduates in considerable numbers are coming to California from all parts of the United States and in fact from many countries, and the number of graduate students who have taken their bachelor's degrees in other institutions is increasing. In particular there is free movement of graduate students from the University of California to Stanford University and vice versa. With us therefore, the migration of students is already a live question. At the present time we have representatives from one department (mathematics) studying at Göttingen, at Zürich (two students), at Harvard, and at Chicago; and these young men have gone away from us in response to our urgent advice. Whatever personal interests our professors may have in this matter, I think they are willing to waive them in the interests of higher scholarship. We desire to take the large view of this question."

Professor Judson, of Chicago University, urged upon the attention of the Association the subject of migration of professors: "The University of Chicago is exchanging professors, not only for the summer session, but also during other parts of the academic year." He made a strong plea for the migration of professors, emphasizing the advantages

resulting therefrom to the universities, professors, and students.

Professor Remsen humorously objected to being called a pessimist on the question under consideration. "I gladly take back anything that I may have said in disparagement of migration. I am unable to explain the fact that my experience differs from that of the other delegates, unless conditions in chemistry are different from those in other subjects. With five hundred students who have come under my observation in twenty-five years very little migration has taken place."

Other delegates made brief remarks in favor of migration. Dean Briggs read an expression of opinion for Harvard University, which was favorable to the migration of students and professors.

Monsignor Conaty expressed the opinion that the migration should be treated with a view of protecting the doctor's degree. "This, I believe, was our object in forming the Association. The question of migration largely depends on the uniformity of requirements for the doctor's degree, and no practical results can be arrived at until the matter of requirements has been settled."

At the second session, held on Wednesday forenoon, the type of examination for the doctor's degree formed the subject of discussion. Professor Magie presented a paper prepared for Princeton University, and said in part: "The degree of Doctor of Philosophy implies power to do original work and to supervise and criticise the work of others. One of the tests of the fitness of the candidate is the examination." The method of examining for the degree in Germany was detailed, and it was contended that a similar method should prevail in this country. "It is characteristic of this method that the examination is held orally on large subjects (as physics) and not for the purpose of assigning relative rank."

Professor Newbold, of the University of Pennsylvania, said: "Our conclusions are directly opposed to those

expressed in Professor Magie's paper. When our system of examinations for the doctor's degree was organized in 1882, we followed the example of Germany. But this was soon abandoned as unsatisfactory. I have conducted about one hundred such examinations, but do not believe in them. I do not see the necessity of continued contact of the candidate with the professors. We have now introduced written examinations in place of oral and find them more satisfactory. We consider the oral examination absolutely useless, except as an academic ceremony. But for this we have now provided by means of a faculty meeting, at which the candidate is present and gives a full account of his work. This insures the principle of publicity. Our present system is of recent origin, and experience must show whether it is the best."

Professor Remsen: "We have tried every possible form of examination at Baltimore, and shall undoubtedly continue to do so. There are two main types of examinations, (1) those which call for action by a society for the prevention of cruelty to animals, (2) those of a liberal character. The candidate can be better judged by years of contact. Yet I find out something interesting in every examination. I do not attach much weight to the examination if I have had an opportunity to form an opinion about the candidate's qualifications." He cited cases where excellent men had gone to pieces in the examination, while other very moderately prepared candidates had made a good showing. He had therefore lost all faith in the formal examinations as an absolute test. "The examination should be a long and unconscious one on the part of the candidate, lasting over two or three years." He did not see, however, how the oral examination could be avoided. "It must be retained as a stimulus to the student to make his best efforts." In response to a question by President Angell, whether professors, who had not taken part in the instruction of the candidate, assist at the examination, Professor Remsen said that this had been the custom at Baltimore, but that it was found to be unsatisfactory.

President Angell then called for information concerning the procedure in German universities in recent years.

Professor Stringham suggested that Professor Leuschner be called upon for his observations.

Professor Leuschner: "There appears to be no uniformity of conducting the examinations in different German universities, nor even in different departments of the same university. My own experience was somewhat out of the ordinary, and therefore does not entirely represent the general case, but I shall be glad to give it for what it is worth. I went to Europe, while on a year's leave of absence, after having completed in this country all the requirements for taking the Doctor's degree in the University of California, with the exception of presenting a dissertation. At Berlin, which university I had selected as offering the best opportunities in my chosen line, I was urged to go elsewhere for a doctor's degree. The Professors concerned were willing enough to have me become a candidate for the degree, but they contended that the regulation, demanding the 'triennium' in German universities, would make it impossible for me to present myself at Berlin. Having decided to take my chances on this point, I took up my studies at Berlin and presented a dissertation to the Dean, Dr. Dames, after about one year. The Dean is not authorized to receive a dissertation unless accompanied by a certificate of the 'triennium,' but Dr. Dames, personally believing that an exception ought to be made in this particular case, desired to have the senate concur in refusing my application. The senate however, on the urgent recommendation of the professors concerned, appointed a committee to report on the thesis. The report being favorable, a 'Dispensation' from the 'triennium' was secured from the 'Cultusminister' and an oral examination was granted. I must admit that I had the good will of the leading Berlin astronomers through interchange of publications and other scientific intercourse. With reference to the examination I may say that while it was

searching and exhaustive, covering the whole field of astronomy, and several branches of higher mathematics, in addition to psychology, which latter is demanded from all students who do not offer the history of philosophy, it involved no trick questions, and the questions could readily be answered by one who had taught most of the subjects for a number of years. At Berlin the candidate generally pays a formal call on his examiners a few days prior to the examinations, and he is frequently asked in what particular branch of his major and minor subjects he is most interested. The examiners are appointed by the Dean, but generally the student's preferences are regarded. Frequently the examination is merely a matter of form. With reference to securing credit at Berlin for work done at home, as part of the 'triennium,' American students have the greatest difficulties. The individual Professors, with many of whom I discussed the subject, were in favor of accepting residence at leading American institutions, but the senate can take no action without discriminating arbitrarily on the American institutions. I was told that the problem might be solved if we would give official information concerning the character of our graduate instruction. It will be remembered that the desire to secure such information from each other resulted in the first meeting of this Association."

Professor Stringham then outlined the practice at the University of California: "The organization at California is in its early stages but we have a method that is working fairly well. We are guided to a considerable extent by the practice in sister universities. We do not pretend to set up a standard independently of other institutions. We aim at thoroughness, accuracy, publicity, and record. In order to bring about these ends, besides the usual safeguards of committees who report at frequent intervals upon the student's progress, we print a programme of the examination, which is placed in the hands of the candidate at the examination, and is distributed to those in attend-

ance. The examination is public and oral. Printed invitations are issued by the committee that conducts the examination to such members of the university, both professors and graduate students, as are likely to be interested in the examination. The thesis and the examination upon those subjects that are involved in the thesis, form the most important part of the test. The questions to be asked of the candidate are not printed in the programme."

Specimen copies of some of the California programmes were distributed to the delegates, and elicited much interest.

Professor Shea, of the Catholic University of America, endorsed Professor Leuschner's remarks concerning the examinations in German Universities. He added—"that the examinations seemed to be more rigorous at Harvard than in other places, where it was sometimes merely a matter of form. The Catholic University lays the greatest stress on the dissertation which is submitted to specialists in other universities for criticism."

Professor Smith, of Wisconsin University, spoke of his experiences at Leipzig twenty years ago, when he had been allowed to select the examining professors. The thesis seemed to be the most important part of the examination in his case.

Professor Hale, Chicago University, thought that the thesis should form an important, but not the sole test, of the candidate's fitness for the degree.

President Harper expressed himself as being well pleased with the printed programme adopted at the University of California. "We have decided," he continued, "to introduce the same system at Chicago. It gives a good all-round understanding of the case on the part of the student, the professors, and others present, and insures the principle of publicity."

President Hall, of Clark University, spoke on the importance of a period of candidacy. "At Clark University we have dispensed with written examinations, and with publicity in the oral examination, which is conducted

in the strictest privacy. Steps should be taken to protect the doctor's degree."

President Angell called for a statement from Harvard University.

Dean Briggs said in reply, "A thesis, to be accepted by Harvard University, must add knowledge to the subject. The examination is conducted by a large division, of which there are several." He then explained the Harvard system in detail, as printed in the Harvard Catalogue.

Professor Crane of Cornell University declared that the discussion had convinced him that substantial uniformity as to the types of examination exists in the leading universities. The procedure at California University is an exceedingly interesting one. At Cornell University the candidate is also under the supervision of a committee, with which he has a definite understanding.

The discussion then narrowed down to whether the examination should be written or oral, Professor Newbold defending the written examination, while President Angell and others took the other side. Excepting the representative of Pennsylvania University, all the delegates favored an oral examination.

The subject for discussion at the third session, Wednesday afternoon, was "Fellowships." The discussion was opened with a paper for the University of Chicago by Professor Harry Pratt Judson, who said in part: "During 1898–99 the number of graduate students in the United States was over five thousand; this was at the rate of seventy-four to one million of population, as against five to one million in 1872. There were in existence four hundred and forty-four fellows, of whom two hundred and ninety-three belonged to institutions of this Association. There are material diversities in practice in amount of stipend, in point of requiring tuition fees, in point of requiring services, and in date of appointment. Students may apply simultaneously, and thus may be appointed, in several places. The number of predoctoral fellowships should be

lessened and more research fellowships with a larger stipend should be established. These should be for those who have made the doctorate with credit and who have already in hand a promising investigation."

Professor Butler: "At Columbia University we have two kinds of fellowships, university and endowed fellowships. The conditions are practically uniform for the two classes. For our thirty annual fellowships we have in general three hundred and fifty to four hundred applications. The applications are allotted to the heads of the departments in which the fellows desire to be appointed. These make full reports to the Dean, who then transmits the reports to a standing committee, which makes final selection of the applicants. To prevent the acceptance of a fellowship in another university after appointment at Columbia, all successful candidates are notified about ten days before the list of successful applicants is published, that they must pledge themselves to accept the fellowship, if appointed. The university fellows formerly received five hundred dollars and free tuition. Recently we have cut down the number of university fellows from twenty-four to eighteen and we make them pay tuition. We award the fellowships, in general, to applicants near the close of their graduate studies. There are altogether too many fellowships in this country in comparison with the number of those deserving encouragement. I counted three hundred and seventy-one about two years ago. At Columbia each fellow is required to undertake such research work as will lead to a doctor's degree. The fellows holding endowed fellowships are frequently reappointed."

Professor Remsen contended that the matter of fellowships was now being overdone in American institutions. "Men of brains, men who can do original research work of value, are fewer in numbers than the existing fellowships. They have to go to men whose mental caliber is not sufficient, and the whole system of fellowships suffers in consequence. This is our experience with the twenty

fellowships at Johns Hopkins University. A few graduate scholarships for the most promising students would answer our present needs. The balance of the funds thus released should be applied to research fellowships to be awarded to the most capable men after taking their doctors' degrees. But even then not enough men can be found who deserve thus to be encouraged. At Johns Hopkins fellows who are well on towards their doctor's degree may be called on to render assistance in instruction."

Professor Newbold: "Our principal fellowships are nineteen at $500 and five at $800. Some of these are restricted to graduates of the University of Pennsylvania. The conditions for award are, a bachelor's degree, French, German, and one year of graduate study. Senior fellows are allowed to teach two hours a week. They must publish their researches, and they are appointed for one year only. The departments in general are much strengthened through the work of the fellows."

Professor Birge, of Wisconsin University, stated that Wisconsin has fourteen university fellows who are expected to conduct one recitation a day or render a corresponding amount of laboratory assistance. A state institution, he explained, must have some return for its money.

President Hall said that the number of fellowships at Clark had been reduced from six to one and that they paid no fees.

Professor Crane stated that Cornell University spends nineteen thousand dollars annually on fellowships. Formerly these fellowships were awarded in open faculty meeting, but this was found unsatisfactory. They are now awarded outright to the various departments, which are held responsible for the appointments which they make.

Professor Stringham: "We are not embarrassed by an excessive number of fellowships at the University of California. We have but few, at most seven or eight, and we have no difficulty in awarding them. With the exception of the three fellowships in astronomy they may be

used for purposes of study in other institutions, and in some cases the recipients are advised to study abroad. We aim to make our fellowships aids to research, but they have not in every instance been used for this purpose."

Professor Stringham then referred to the following resolution of the Graduate Council of the University of California as approved by the Board of Regents:

"That persons appointed as fellows be required to devote all their time to advanced study; except that on the recommendation of the head of the department concerned, and by vote of the Graduate Council a fellow may be allowed to offer advanced instruction in the immediate line in which he is studying to an extent not exceeding two hours a week, or to assist advanced students in laboratory work not more than six hours a week."

Professor Magie contended that fellows were not in general as interesting a body of men as other graduate students.

President Angell said that the question of fellowships was not a problem in the state universities, as they had very few to award.

Dean Briggs said that out of three hundred and forty graduate students of Harvard, one-fourth hold salaried fellowships. In addition there are honorary appointments called John Harvard Scholarships, awarded to give the holder standing in other institutions. They are awarded by a committee. Dean Briggs referred to the Harvard Catalogue for further details.

The final session of the conference, Thursday morning, was devoted to the topic, "To what extent should a candidate for a doctor's degree show a knowledge of subjects not immediately connected with his major subject." The discussion was opened with a paper prepared for the University of Pennsylvania by Professor Newbold, who said in conclusion:

"1. The battle between the old classical ideal of liberal culture and the newer ideal of culture derived from the

pursuit of learning for its own sake in any field, is practically decided in favor of the latter.

2. It is probable that a new issue will be opened, in which the old names figure, 'liberal' culture being identified with *extensive* culture as against the *intensive* culture of the specialist. What will be the duty of the graduate school towards this issue?

(*a*) I would reply that the interests of the graduate school are not at the present time threatened by the degree of undergraduate specialization which we commonly meet.

(*b*) That the graduate school may safely allow considerable liberty of specialization to undergraduate students; that it is not possible to specify in advance any definite degree of specialization beyond which candidates for the Ph.D. degree will not be allowed to go.

(*c*) That the extremes of specialization can probably be prevented by the graduate schools' refusing to grant the doctor's degree in less than three years after graduation.

(*d*) That students who have specialized too much or too little as undergraduates should be encouraged by the authorities of the graduate school to specialize less or more in the course of their graduate work, and thus correct their early mistakes."

Following Professor Newbold, Professor Magie outlined the position of Princeton University on the subsidiary requirements. He took issue with Professor Newbold on various points. In the course of his remarks he said that Princeton University was so thoroughly convinced of the wisdom of requiring a knowledge of Greek in addition to Latin that he could not say what the result would be if a graduate of Harvard who did not offer Greek should apply for the doctor's degree at Princeton University. Professor Magie discussed somewhat in detail his impressions as to the relative quality of the undergraduate students in the liberal and scientific colleges. In his opinion the scientific students were, on the whole, an inferior body of men.

Professor Crane, speaking as a graduate of Princeton and therefore as one whose motives would not be misunderstood, suggested that by reason of a lower standard of admission the scientific school at Princeton gets, as its contingent, only those students who cannot be admitted to the academic department proper. Such a disposition of forces would be likely to bring together in this scientific school an inferior body of men.

President Angell inquired whether any universities took the ground that Doctors of Philosophy should above all be qualified to be successful teachers in their special line.

It was the opinion of those who took part in the discussion on this point that doctors should be successful teachers.

Professor Stringham: "It is unfortunate that the candidate should be obliged to spend any of his time in piecing out a deficient undergraduate training. Yet many graduate students begin their studies at California, with the doctor's degree in view, before they have fulfilled all our requirements for candidacy. We insist upon Latin equivalent to about four years' study of this subject in the high school and upon a reading knowledge of French and German. Many Bachelors of Letters and Bachelors of Science come to us with some or all of these studies omitted from their undergraduate programmes. We regard this as a great evil. These degrees, as given in many of our institutions, are distinctly inferior to the Bachelor of Arts degree.

"Our conditions for the doctor's degree call for two minor subjects, and we expect these to be chosen in studies closely allied to the major but in different university departments. Such a distribution of the candidate's work usually places him under the joint guidance of three professors representing different departments. It has happened in the past, however, that two of these professors represented the same department."

Professer Leuschner: "The ideal undergraduate course should above all fit the student for life in general, it should

also endow him with a thorough liberal culture both from the point of view of the classics and history and from that of the pure and the applied sciences, and lastly, it should furnish him with knowledge sufficient to enable him to specialize in any direction whatsoever. The course which, in my mind, comes nearest to meeting these requirements is that of the German 'Gymnasium.' It leads to any and all higher pursuits in life. But, although a graduate of one of Germany's leading 'Gymnasia,' I cannot help but feel that the 'Gymnasium' course has many defects, chief among which is its failure to develop to the highest degree the talents of the individual. There is a good reason why we could never adopt, in this country, a course like that of the 'Gymnasium.' It is simply that our American boy would never submit to the severe life of the German 'Gymnasiast.' There are other reasons, however, why I should not consider it wise to adopt the German system. Thus each college and university of this country finds itself called upon to solve the problem as best it can. Perhaps the main strength of our American system of education lies in the very diversity of the methods adopted in different institutions, but undoubtedly this diversity interferes to some extent with the free circulation of graduate students from one institution to another, especially of those who desire to proceed to a doctor's degree. Now is there any reason to believe that any one institution rather than any other has succeeded in discovering the correct way of dealing with the question? May we not consider the different solutions reached by really good institutions to be equivalent? What then should keep the individual member of this Association from giving to the bachelor's degree of its sisters in the Association the same recognition as a prerequisite to candidacy for a higher degree that it does to its own? The University of California would gladly coöperate in such a movement. It is the policy of the University of California to approve of any action that will secure in the various universities of the Association mutual recognition

of their bachelor's degrees as far as this is possible without interfering with high standards.

"No university, however, needs to waive the right of rejecting a graduate from another university in the Association, any more than we waive the right in California to deny one of our own graduates the privilege of proceeding to the doctor's degree if, in the opinion of the committee which supervises his work, he is not the ideal candidate for that honor, though he may have met all formal requirements.

"As regards the question asked by President Angell whether in turning out Doctors of Philosophy some or all of the universities here represented lay emphasis on the qualifications of the doctor as teacher, I believe that while we duly take care of that side of their preparation, we lay the greatest stress on turning out doctors who are capable of doing original work, and who will be leaders in their chosen field. In this connection I may add, that the Berkeley Astronomical Department, which sends students to the Lick Observatory for part of their graduate work, recommends for admission to the Lick Observatory only students who, in their Group Elective work, give evidence of exceptional qualifications as accurate observers and computers, and of ability for original research. Students who show only average ability are thus not encouraged to go on with astronomical studies and the same policy is observed in many other departments of the University,"

A very pleasant feature of the second annual meeting of the Association was the banquet given in honor of the delegates by the University Club of Chicago on Wednesday evening, February 27, 1901. The following toasts were responded to:

Special Training for Consular and Diplomatic Service—President James B. Angell, University of Michigan. The Three Years College Course—Professor LeBaron R. Briggs, Dean of Harvard College. Freedom of Speech in University Circles—Vice-President John C. Branner, Leland

Stanford Junior University. Religion and Science—Right Rev. Monsignor Conaty, Rector of the Catholic University of America. Shall Professional Schools Require for Admission the Bachelor's Degree?—Professor Ira Remsen, Johns Hopkins University. University Possibilities at Washington—Professor Nicholas Murray Butler, Columbia University.

These addresses will be printed by the University Club of Chicago. President Hadley was expected to respond to the toast Will College Class Feeling and Organization Sometime Disappear in Our Colleges? but was unable to be present.

The Association deliberately abstained from passing resolutions, or formulating policies, and up to the present time no action has been taken which hints at the abridgement of the rights, powers, or privileges of the individual members of the Association. It was even thought best not to suggest that any greater uniformity of procedure in relation to graduate instruction and the doctor's degree than already exists at the fourteen universities represented in the Association, should be urged at the present time.

The message of the Association to its members, therefore, is not a formulated judgment pronounced by a higher authority, but a bundle of items of information brought in from fourteen of the most important centres of higher educational activity, and pregnant with important suggestions concerning matters with which we are struggling at the present moment in our own University councils.

The delegates at the second conference were unanimous in the belief that the work of the Association has been well begun and that it should go forward, mainly upon the lines followed at the two conferences already held, by formulating its action at the successive meetings, rather than by a predetermined policy.

OFFICIAL ACTION.

At a meeting of the Regents, March 12, 1901, President Wheeler presented the following letter:

The Congregation Emanu-El of San Francisco, having recently celebrated the fiftieth anniversary of its founding, the ladies connected with that organization desire to establish a permanent memorial of the jubilee. They wish that memorial to take the form of one or two fellowships in the Semitic Department of the University of California, to be named the Emanu-El Fellowship in Semitic Languages, so that the name of the great Congregation they represent may in this manner remain identified with the progress of learning in California and on the Pacific Coast.

The time having been too short to raise the permanent endowment for these fellowships, I am authorized to tender you the amount of six hundred dollars, being five hundred dollars for the first year's stipend and one hundred dollars to provide such acquisitions as the Semitic Library may need at the present time.

I am assured that a similar amount for the purpose stated will be forthcoming from year to year, until the requisite endowment of fifteen thousand dollars will have been collected, which collection, I anticipate will be completed within the next two years.

I have the honor herewith to enclose my check for the amount, and if this contemplated foundation meets with your approval and the sanction of the Board of Regents, the Semitic Department will ask your consent to name the stipendiaries for the academic year commencing in August, 1901.

I have the honor to subscribe myself, Mr. President,

Very respectfully,

JACOB VOORSANGER,

Rabbi of Temple Emanu-El, Professor of Semitic Languages and Literatures in the University of California.

President Wheeler recommended a vote of thanks to the ladies of the Congregation Emanu-El for their wise and far-seeing generosity, and that the fellowships proposed be established when the endowment shall be completed. The recommendations were concurred in by the Regents.

At a meeting of the Regents, March 12, 1901, William Inch was appointed Reader in Greek; R. E. Gibbs, Reader in English; C. G. Dall, Assistant in the Lick Observatory; J. D. Maddrill, Student Assistant in the Students' Observatory; A. J. Cloud, Secretary of the Lick Observatory; George A. Merrill, Director of the Wilmerding School; Elwood Mead, Professor of the Institutions and Practices of Irrigation.

At a meeting of the Regents, April 9, 1901, Regent Wallace, chairman of the special committee appointed to consider the desirability of making an immediate settlement in the matter of the legacy bequeathed by the late Charles M. Hitchcock, recommended that the Regents sell and convey all the remainder or reversion in fee simple of the University in and to all of the property of the estate of Charles M. Hitchcock, deceased, for the sum of seven thousand five hundred dollars. The recommendation was adopted.

At a meeting of the Regents, April 19, 1901, the following were granted leaves of absence for the year 1901–2: Professors W. B. Rising, E. E. Brown, and C. B. Bradley.

At a meeting of the Academic Council held March 8, 1901, the Schedule Committee reported recommending that the regular lecture period be increased to one hour, and that the first period begin at eight o'clock a.m. On motion the report was adopted.

At a meeting of the Academic Council held April 5, 1901, the Committee on Schools reported in favor of permitting intrants to combine History (one unit) with Natural Science or Mathematics (one unit) for entrance to the College of Social Sciences, Natural Sciences, and Commerce; to offer any two of the subjects Latin 6, Latin 7, French, and German for entrance to the Colleges of Natural Sciences and Commerce; and to offer Spanish in lieu of French or German for entrance to the College of Commerce. The

Committee further recommended the approval of college courses in Latin A: Cicero's Orations, Virgil's Aeneid; and Latin B: Latin Composition; these courses, which are identical with matriculation subjects *7a* and *7b* to be counted for free elective work only in all colleges, subject to their regulations. The report of the committee was adopted at the meetings of April 5 and 10.

At a meeting of the Academic Council held April 5, on recommendation of the Committee on Regulations, the following regulation was adopted:

58. Every undergraduate student who intends to become a candidate for a degree must file with the Recorder of the Faculties a detailed schedule of studies offered for the degree sought. This schedule must be filed by Regular students at least six calendar months, by all other students at least one full academic year, before the date proposed for graduation, and must be approved by the Committee on Classification of Studies and Degrees of the college in which the student is enrolled.

At the same meeting, on recommendation of the same committee, the words "But no student with a deficiency will be advanced to Senior standing" in Regulation 40, and "of not less than six calendar months' standing" in Regulation 42 were struck out; and Regulations 51 and 54 were repealed.

CURRENT NOTES.

On March 18, a number of his friends and colleagues gave a banquet at the California Hotel, San Francisco, in honor of Professor F. G. Hesse, on the completion of the twenty-fifth year of his service as Professor of Mechanical Engineering in the University.

During the month of March Hon. John W. Foster delivered a course of five lectures at the University on The Practice of Diplomacy. Mr. Foster has served as Minister

to Mexico, Russia, and Spain, and as Secretary of State under President Harrison.

Following Mr. Foster, Mr. Eli T. Sheppard, formerly United States Consul at Chin Kiang and Tientsin, China, delivered four lectures on The American Consular Service.

These courses of lectures were secured by the University authorities in accordance with the desire of the University to build up a College of Commerce, and to make provision for the training of young men for diplomatic, consular, and business careers in foreign lands.

During April Director Campbell of the Lick Observatory lectured before the astronomical students of the University on "The Determination of the Motion of the Solar System from Observations made with the Mills Spectroscope" and "The New Star in Perseus"; and Astronomer Tucker, on "The Solar Parallax from Eros" and "The Position of Reference Stars for Eros."

The Lick Observatory has announced the publication of a bulletin, to be issued from time to time to bring to the attention of astronomers throughout the world important results achieved by the astronomers on Mount Hamilton. The bulletin is not intended to be a medium of publication for matter in final and detailed form; it will contain announcements of the more important discoveries and the publication of results whose usefulness depends upon prompt distrbution, and results unsuitable for journal publication which cannot await publication in journal form. The bulletin will be distributed to the principal observatories and institutions of learning of the world. The first number, published in March, contains some valuable meridian circle observations of reference stars for the planet Eros at opposition, 1900. It has been compiled by Astronomer R. H. Tucker. These results will be of great value in the campaign to determine the distance of the sun, in which the principal observatories of the world are now engaged.

The subordinates in the language and literature departments of the University organized in April a Philological Club, whose objects are stated in its constitution to be "to serve as a stimulus for the production of literary and philological papers and to promote comradeship among men of similar tastes and pursuits." Eight regular meetings are to be held each academic year, and at each two papers, as far as possible in different fields of philological work, are to be read. Each active member obligates himself to prepare at least one paper a year. At a meeting held April 10 the following were elected officers for the ensuing year: President, Wm. D. Armes, Assistant Professor of English Literature; Vice-President, Mr. C. R. Keyes, Instructor in German; Secretary-Treasurer, Dr. J. T. Allen, Instructor in Greek and Classical Archaeology. The first regular meeting at which papers will be presented will be held on the last Monday evening in August. The Club will begin work with an active and associate membership of about twenty-five.

President Benjamin Ide Wheeler has received an official notification of his appointment by the President as a member of the Board of Visitors for the West Point Military Academy. His coadjutors are Lieutenant-General Schofield, retired; Major-General Daniel E. Sickles, retired; St. Clair McKelway, New York; President Charles W. Eliot of Harvard University; William H. Upham, Wisconsin; St. George R. Fitzhugh, Virginia. It is the duty of the Board of Visitors to attend the annual examinations at the United States Military Academy, to inquire into the actual state of the discipline, instruction, police, administration, fiscal matters, and other affairs of the institution, and to report upon these matters to the Secretary of War for the information of Congress. The annual examinations will commence on Saturday, June 1.

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OUR ANNUS MIRABILIS.*

By CORNELIUS BEACH BRADLEY.

In 1667—exactly two and a third centuries ago—John Dryden was a young aspirant for the laurel wreath. Like many another Englishman of that day, he had changed sides at the Restoration, and since then he had been rather anxiously awaiting the arrival of some fit occasion for celebrating the greatness and goodness of his new master, Charles II. Since Charles was what he was, the fit occasion was slow in coming; and, rather than wait too long, the young poet was fain to content himself with a series of notable occurrences clustering about the year just past, 1666,—disasters though most of them were,—and to couple with his account of them such fulsome flattery of the king as the gross taste of the time permitted and encouraged.

The first in this series of occurrences, and perhaps the most memorable of them all, was the Great Plague of London. The disease was, alas, no new one. From the sixth century on it had moved westward over Europe, like a resistless rising tide, advancing and retreating in a series of tremendous waves, each gaining on its predecessors, until high tide was reached in that awful visitation which in the fourteenth century swept Great Britain, destroying, as is believed, from one-third to one-half of the entire population of the

* Read before the Berkeley Club, February 28, 1901.

island. The deadly tide now ebbed. England, the utmost coast on which its waves could break, was reached less and less frequently, and with less and less violence. But almost the very last wave to reach her shores was a decuman wave, which in 1665 spent its force upon the capital. This visitation was not nearly so widespread, nor in its aggregate so deadly, as that of three hundred years before; yet it was awful enough to have o'erfreighted Dryden's ode with woe, had he included it in his scheme. Fortunately then for his immediate purpose, as well as for England, the plague had pretty well burned itself out in the year preceding the one he chose specially to commemorate, and there was no need to include it. Thus it was left for De Foe, some sixty years later, to take advantage of the interest and terror inspired by the next approaching wave of the plague, and to exploit in genuine modern fashion the greatest portent of all this series. His famous Journal of the Plague Year, though written by one who could have had no personal memory of the events, has all the vividness and convincing reality of the testimony of an eye-witness—which indeed it purports to be, and for which it has been repeatedly mistaken.

The next event, and the one upon which Dryden put his chief effort, as lending itself best to panegyric of England and of her new rulers, was the war with the Dutch. The naval battles, indeed, which he celebrates, though most stubbornly fought out on both sides, were inconclusive. Neither the palm of bravery nor of energy nor of skill can be confidently awarded to the one rather than to the other. Nor was the immediate advantage overwhelmingly on England's side. But it was a strenuous passage at arms, in which the king, his brother, and his cousin, Prince Rupert, had borne themselves not unworthily; and that was foundation enough for fulsome panegyric and for depreciating in regular John Bull fashion the equally high spirit of the foe. What gave the matter its real significance and whatever valid title it had to a place in the *Annus Mirabilis*, was something other

than all this, was something which neither Dryden nor Charles could have really understood:—that this was the second act in that long struggle which Englishmen were to wage with their kinsmen and neighbors for commercial empire;—not merely, as at that moment, in the narrow seas which separated their home-lands, but in America, in India, and in the islands of the sea. Its beginning was the famous Navigation Act of Oliver Cromwell; and its last scene—if indeed it be the last—is now enacting under our eyes in South Africa. But of this more anon.

The Great Fire of London, Dryden's other portent, was spectacular indeed, and tremendous enough to those who witnessed it. But in the summing up of England's affairs, we see now that it was of no appreciable weight or importance; and even as regards the city itself, it was of lasting good rather than harm. It destroyed the noisome seed-beds of the plague, and made possible a more sanitary rebuilding, to which, no doubt, London largely owed her subsequent immunity.

Such were the wonders of Dryden's wonderful year—wonders spectacular merely, of no far-reaching importance whether in the physical realm or in the moral, at least so far as he or his times discerned them. One matter of really great moment had come, as we have seen, a little too early to fall within the limits of his year, and moreover had failed to lend itself to his immediate purpose. And, shortly after Dryden's poem appeared, another event occurred, not at all with observation, but of importance greater far than any of these—transcending even all else which happened in Charles' reign—the appearance of the Paradise Lost. It was too late for Dryden; and had it been in time, it would have lent itself still less than the Great Plague to the flatterer's use. Better probably than any other man of that time Dryden could have guessed somewhat of its real power and import as an immortal work of art. But even he could not have foreseen how strongly the thought of that blind poet was to shape the imagination and the convictions of

generations of men; how Milton's imagery should become the almost inevitable imagery in which men of our race must clothe their thought of that existence and of those realms and powers that lie beyond the veil. Thus strangely do realities, as we are pleased to call them, and mere imaginings sometimes change places!

Since then two and a third centuries have slipped away, and again do we find ourselves in a cycle of wonders which this time we make no doubt are really wonders, and no mere commonplaces tricked out in the hues of our own fancies. In one sense, to be sure, there are no wonders. Each thing which a day brings forth has had its foundations laid and its opportunity prepared from of old, before there were suns or stars. But while everything thus enters into the "one increasing purpose" which "through the ages runs," while all things in a sense are equally inevitable and equally necessary, not all things are equally impressive. There are crises in the movement when the agencies emerge from the stream of circumstance, and stand visibly forth. There are dramatic moments which really gather up into themselves ten thousand separate, errant impulses, combine them, and launch the resultant forth portentous, irresistible. And at such moments nothing can avail to cheat the human heart of the joy of wonder.

Then again, our centuries, as we know, are mere fortuitous units of measure. We cannot conceive them as having any vital or necessary relation whatever to the great movement and destiny of human affairs. Yet how strange it is that, as we look back over the nineteen hundred years of our era, we find the events of real significance and moment somehow clustering about these milestones which we have set up to keep us from losing our way! There is the first great defeat of the Roman legions under Varus at the very opening of the count—prophetic of long centuries of losing battle for the old world-order, and the passing of the sceptre to a race that should make the world new. There is Constantine and the establishment of Christianity at the

third milestone. There is the deluge of northern invasion, and the sack of Rome at the fourth; Theodoric the Goth, Clovis the Frank, and the faint glimmerings of a new order at the fifth; Mohammed and Gregory the Great at the sixth; Charlemagne at the eighth; King Alfred at the ninth; the first Crusade at the eleventh; King John, Magna Charta, and St. Francis at the twelfth; Dante—the "voice of ten silent centuries"—at the thirteenth; Chaucer at the fourteenth; the discovery of America and the re-discovery of the world of classical thought at the fifteenth; Shakespeare and Queen Elizabeth at the sixteenth; the English Revolution at the seventeenth; the French Revolution at the eighteenth; and, most striking of all, the meeting of innumerable streams of human effort, interest, and tendency within the last few years of our own time. Nor does it seem that this impression of the coincidence of the critical nodes of history with the century periods can be wholly illusory, or the mere result of suggestion from our own sentiment or fancy. The instances are too numerous and too vital, explain them how we will.

In looking at matters so immediately at hand as these last we have not, of course, the true perspective, and cannot surely discern their importance, absolute or relative. But our interest we cannot withhold, nor can we suspend our judgment altogether. We still must try to read them as we can. Approaching thus the events of recent years, we are aware of a certain increase and heightening in all departments of human affairs. There is an acceleration of movement and a crescendo of volume beginning indeed far back, but rising now with a steepness of curve which speaks a climax at hand. In the realm of science and the industrial arts—to cite but a single example out of scores—there is the advent of the new power of electricity, with its vast range of already demonstrated uses, and its almost infinite possibilities yet in store. So tremendous is our pace that it already seems as if electricity were an old-time servant of man. It takes an effort to recall that, but

a score of years ago, the force which drives our thundering chariots, and the fire which kindles our cities with splendid illumination, and sets them like flashing diadems upon the brow of night, was scarcely known outside the laboratory; that but three or four years ago Roentgen rays and wireless telegraphy were things undreamed of. Within this same short period again what developments have we seen, both sinister and benign, of the far-reaching power of human organization and combination—in trusts and in labor-unions, in the Red Cross society, the political boss, and the sympathetic strike! In our own lives, professional, commercial, domestic, what quickening of pace, what fierceness of competition, what accession of splendor, of complexity, of care;—until the lives we ourselves lived in our boyhood now seem to us as slow and as far-away as the days of Methuselah! There are few of my readers, I imagine, who do not remember when the map of Africa was mostly a great white blank; when the now truculent German Empire was an infant in swaddling clothes; when Italy and Japan were still in the womb of the feudal ages; when it was supposed that the far-shadowing power of Russia might be effectually "cribbed, cabined, and confined" by turning the key of the door at Constantinople. On the last tragic act of Spain's long struggle for colonial empire, the curtain has but just fallen; and but now our own country, parting company with the traditions and maxims on which was nourished her "youth sublime," steps jauntily forth into the race for the self-same prize.

But beyond all this general deepening of interest toward the close of the century, there seems to be a special emphasis laid upon its very last year, so as in some true sort to single it out, and to give it a far better right than Dryden's ever had to the title of *Annus Mirabilis*. I have no ambition to wear Dryden's laureate wreath,—or even Austin's, his successor *longo intervallo;* yet in more modest fashion would I venture to set forth the claims of the year 1900 to distinction.

Among these claims I do not include that singular dispute, at once fierce and whimsical, which ushered it in, and which raged all the way from peasant to pope, and mayhap still lives—the dispute as to which century it is to which the year rightfully belongs. Indeed, I should not be at all surprised if some of my readers were ready at this moment to take up the cudgels on one side or the other of this famous controversy. But against all such I record my veto. A truce to all such untimely quarrels! It is enough that it was a year of stirring movement and world-wide surprise, at the end of—and fit to stand in either enumeration at the end of—a century more surprising and more stirring, perhaps, than any other that can be named.

In the interest still of peace, though the matter is of graver import, I shall lay no special stress upon a circumstance which connects our year significantly with Dryden's; namely, the appearance of the plague once more in England and Scotland, to say nothing of places nearer at hand.* The plague had not visited England since Dryden's time, nor any part of western Europe since 1722. Its steadily diminishing area and destructiveness induced the hope that the force of this the deadliest of all epidemics was really spent. But such is found to be by no means the case. And, though we have reason to think that the improved medical skill of our day and improved sanitary science may defend civilized peoples from such horrors as once were common, it is well not to be too confident, and to bear in mind the lessons all too easily forgotten of the plague-scare of the year 1900.

Among the other things which combine to make the year really memorable there stands out, first of all, the South African war, the main movement and brunt of which fell within the year, although its beginning was earlier and its end is not yet. The chief dramatic and spectacular interest of that war lay, of course, in the heroic and amaz-

*An angry discussion is still going on (Feb., 1901) as to whether the plague did or did not appear in San Francisco during the year 1900.

ingly effective defense, maintained single-handed and for so long, by a few simple, rural folk against the whole available power of the richest and strongest nation in the world. This interest the conflict always will have, no matter what may be thought of the merits of the question at issue. But this is not all. Whatever may be its final outcome, it seems certain that this war is the last and most tremendous act in that long drama of strife for commercial and colonial advantage between English and Dutch, the beginnings of which date back, as we have seen, to Cromwell and Charles—so strangely and indivisibly are things far and near bound up in the same bundle of fate! The *last* act this surely must be, because at home the Dutch have long since withdrawn from the "swagger set" of Europe, and are there secure in their lowliness and the consequent protection of their stronger neighbors. The few colonial interests they still retain are probably safe under the same guarantee. And nowhere more in the world can there be found a detached mass of Dutch folk so circumstanced as to tempt or to provoke attack.

The war is memorable again from yet another point of view. Quite up to within our own life-time Africa has been almost the only remaining exemplar and stronghold of a world-order that dates back far beyond the dawn of history. Throughout the whole continent, with the exception of Egypt and an intermittent fringe of areas along her coast, there flourished in all its fierce glory the great Mammalian Age,—in its characters and marks essentially the same as that whose records are elsewhere read in the rocks, and which in Europe, Asia, and America passed away untold centuries ago before the rising power and competition of man. Within the remembrance of the youngest of us the elephant and the rhinoceros roamed over the plains of Africa, or crashed their way through her trackless jungles. The hippopotamus and the crocodile swam her rivers. Apes, baboons, and gorillas peopled the tree-tops. Countless herds of wild cattle, camelopards, deer, and gazelles

ranged over the veldt or browsed in the thickets, furnishing food to jackals, hyenas, leopards, and to the lion, king and master of them all. In the midst of all this fierce and teeming life, himself a part of it, hunting and hunted, fiercer and wilder than any, lived also man, not yet so far emerged as to master and subdue it, or to subdue and master himself.

> ——"Dragons of the prime,
> That tare each other in their slime,
> Were mellow music matched with him!"

How much longer this state of affairs might have lasted we know not, had it not everywhere been broken in upon and disturbed by the modern spirit of adventure, by exploitation of all sorts in the interest of commercialism armed with modern resources and weapons, and by the eager competition of European powers. Against this invasion and transformation the Boers deliberately set themselves, when they sullenly harnessed their ox-teams, and turned their backs forever, as they hoped, on the new order of things and on the English as its chief exponents. Profiting by the added power and resource which the touch of civilization had given them, they would preserve that savage age, that old-world order, for themselves intact, or at least no further modified than the conditions of their own life rendered inevitable. Thus they became an effective and organized barrier directly in the way of the march of the new order of things. They became, in fact, the *only* effective barrier; for forests, mountains, rivers, deserts, disease, and savage man himself offer but slight resistance to the determined onset of civilization. But this barrier was quite of another sort, as the event has proved. And now that it too has gone down in ruin before the ever-rising tide, we cannot but lament the destruction of that brave and steadfast, though misguided, folk, who flung themselves thus in the pathway of fate. We cannot but denounce the unholy greed and chicane which at last precipitated the conflict. We cannot but wish that some kindlier way had been found to change

the settled resolution of those men. But as long as the resolution held, sooner or later, with pretext or without it, the conflict was inevitable; and of the conflict there could be but one issue. No human barrier can stand against such an ever-rising tide;—nor ought we to wish it to stand. It was in the order of nature that it should give way. So viewing the matter, I doubt not that the South African war, hateful as indeed it is, will finally take its place as one of the most dramatic and conspicuous crises in the fading away of the old order from the last quarter of the globe, and the incoming of the new.

Yet "Woe unto the world because of offences," says the good book, "for it must needs be that offences come. But woe to that man by whom the offence cometh!" The war into which England so jauntily entered has proved to be one of the most serious crises in all her recent career. It had not progressed far before it became apparent that her prestige in the face of the world was at stake, and after that her empire itself. With unflinching determination and superb hauteur she addressed herself to meet the emergency. Such a magnificent single exhibition of power I doubt whether the world has ever seen. To wipe out the disasters and blunders of the opening campaign, she sent 270,000 fighting men to the antipodes, with the most distinguished of all her soldiers to lead them; and there they are still engaged. Five hundred millions of treasure spent, not counting that which war has destroyed; seventy thousand of her sons killed, wounded, dead of disease, or invalided home;—and all as yet unavailing either to hold in security the territory overrun, or to defend from invasion Cape Colony itself. The tremendous strain of the effort is seen in the nervousness of the English public, its lack of composure in the face of trifling reverses, its hysterical welcome of returning troops, its threats of stern reckoning some day with those who have brought England to such a pass; it is seen in the unexampled and anxious alacrity with which England's daughters have hastened to strengthen her

hands. Not victorious yet is she, but never so splendid and so terrible as in this her hour of supreme effort and supreme need. And what if it should turn out, as indeed it may, that this is in very truth her supreme effort? What if, when the subjugation is complete, it should mark the very turning-point in England's career? Outside of her own family England is nowhere beloved in the world. Not merely her pride—her very success has gained her enemies on every hand. She still keeps her place in the lead, but with visibly greater effort and with sharper competition. What if the legacies of bitterness and hate growing out of this very war, the added jealousies and complications on the part of her neighbors, the lasting strain of reorganization and control should together suffice to turn the trembling balance slowly against her? What if Africa should be, as has been prophesied, the grave of the British Empire? *Absit omen!* Yet such things have been. Should it be so,—should the future historian point to this very year 1900 as the climax of England's power and the beginning of her decline, then would it be an *Annus Mirabilis* indeed.

On these last lines the ink was not dry when tidings from across the ocean made it seem as if Death himself had set his seal upon the distinctions of the year by making it the last of the longest and most memorable reign in the annals of England,—perhaps the most memorable in the annals of the world. Though the physical life of the great queen outlasted by some brief days the wonderful century with which she was so signally identified, and the wonderful year of its close, yet the century was for her the real terminus. Her last public act was to welcome home, doubtless from his last campaign, the great soldier who on the stricken fields of two continents had led to victory her "far-flung battle line;"—and so soon it was his duty to lead the solemn funeral pomp which bore her away to the tomb! Fifty years before, while her reign was still young, Wellington was laid to rest—

"in streaming London's central roar,
Where the sound of those he wrought for
And the feet of those he fought for
Echo round his tomb forevermore."

And fifty years before that was Nelson. "O eloquent, just, and mighty Death!"

While one ancient order is passing away in Africa, another less ancient to be sure, but of far greater human interest, is passing away in China. In Africa it was the oldest biological order anywhere extant on so grand a scale; in China, the oldest organized civilization that yet survives in the world. In outward features the Chinese Empire belongs to the same old-world order as did Assyria or Persia or Babylon. It is the same huge aggregation of loosely-coherent provinces ruled by great satraps or viceroys in very uncertain dependence upon the central power. There is the same Babel of tongues, even though the tongues be closely related. There is the same absence of national feeling, national ideals, and national loyalty. There is the same eternal dominance of intrigue as the prime motive force in civil life and government. On the other hand, China is singularly unlike all those in its strong unity of stock or race, and in its remarkable identity throughout in traditions, in prepossessions, and especially in literature, in ideals of life and character, and in habits of thought and action. Not only so; this remarkable unity has survived conquests and changes of dynasty, and is, no doubt, in part the cause, and in part the effect of the surprising endurance of the Chinese order, while all others of its type have passed away. China and Africa have thus become, though in different senses, the two remaining strongholds of the past in a world which is elsewhere new. By her vast mass and inertia, as well as by her lodged and settled hatred of innovation, China, like Africa, has found herself directly in the way of the modern movement and idea—a huge sand-bank sapped by the waves of an ever-rising tide. Because of the special lines on which early European trade was developed,

because of the higher rank of her productions, and because she was a definite organization, China was brought earlier than Africa into the stress of conflict and struggle. The first note of it was sounded in the advent of the Portuguese nearly four centuries ago. The acute stage was reached nearly a hundred years ago when an English embassador at Pekin was driven forth with contumely, for refusing to acknowledge that his sovereign was a vassal of the Emperor of China. And now at the century's close has come the catastrophe with a crash that has shaken the world. It seems more than a striking coincidence that here too the precise point of rupture was the right of embassy. It is rather another startling result and token of the profound isolation of the Chinese system from the thoughts and ideas of the great world about it. It is another striking demonstration of the irrepressible conflict between it and that instinct of modern civilization which everywhere, and as its first condition, demands freedom of intercourse and of movement.

The appalling events of the great outbreak of 1900, and the yet more appalling events which have followed in its train, there is surely no need to recount here. And of these also the end is not yet, nor can the keenest vision discern what the precise outcome shall be. But that it is the catastrophe which we are contemplating, and not merely some passing accident, few any longer doubt. Few now have any lingering thought that the outcome may be the reëstablishment of the old order. Whatever form reconstruction may take, we may be sure that the new order of ideas, and not the old, will rule it.

In this connection I cannot forbear to speak of a tendency of feeling and of utterance in our midst, which has of late been greatly accentuated, and which to some at least is a matter of great surprise, if not of grave concern. "My kingdom is not of this world" said the Nazarene when questioned as to a possible appeal to force in support of his doctrine. "Put up thy sword again into his place," he said

to an overzealous friend who would openly make that appeal;—"all they that take the sword shall perish by the sword." And again, "Blessed are the meek, for they shall inherit the earth;" and "Love your enemies, bless them that curse you, do good to them that hate you, and pray for them that despitefully use you and persecute you; that ye may be the children of your Father which is in heaven." Though the lesson is a hard one, it seemed as though at last the followers of the meek and lowly Jesus were beginning to take it to heart. The church, and especially its ministers, it was felt, were permanently pledged to the cause of peace, and could not consistently be found among those who clamor for vengeance or openly fan the passions which lead to war and bloodshed. Yet in our country, at least, all this seems to have been changed within these last few years. I fear it is not too much to say that the body of our American clergy was prompt and eager to urge on this nation into war with Spain. There were, of course, many and noble exceptions. But so far as my observation and impressions go, that minister was the exception who lifted up his voice in protest; and that religious paper was the exception which did not, and which does not now, defend it. Was it a wave of popular enthusiasm which swept them from their moorings? Was it specious sentiment? Was it the traditional Puritanic hatred of all things Roman? Or shall we be told that herein is no real paradox at all? I know not. And now throughout all this dreadful business in the Philippines and this more dreadful business in China, almost the only voice we hear, whether from missionaries in the field or from their supporters here at home, is the constant demand for more force, greater severity, harder conditions, more blood. The case is one which excites wonderment in the onlookers, even among those who are glad to find this unlooked-for support in their schemes of conquest. But are the gentleness and love which Christ preached so long ago now antiquated, and are fierceness and vengeance to take their place? Was Mohammed

right after all? I cannot undertake to answer these questions nor to explain this not the least surprise of the century-closing year.

Yet while the tragic and somber phase of this tremendous drama in China has occupied our chief attention, its exigencies have brought into counterplay a movement and tendency which seems to me prophetic not of downfall and doom, but of hope—a new and larger hope for the world. The great old-time civilizations were all separative, divisive. Each conceived and developed in practical isolation one, single master-idea. The Hebrew idea of righteousness, the Greek idea of intelligence and ordered beauty, the Roman idea of social organization were thus separately worked out. It required the whole lifetime of a great race or nation, and all its genius, to bring one of these ideas to such clearness and perfection as to permit of its being passed on to others, and so becoming part of the inheritance of the ages. Each civilization developed its idea as far as it could be developed alone. Yet each idea was after all but a partial one, in itself insufficient for the basis of a complete and lasting civilization. Each needed the support and help of all the others before there could be a perfect society. Indeed, it was precisely because of the lack of complementary and supporting ideas that each of these old civilizations was doomed to fade away. The problem of the ancient world was therefore the discovery and the development of these master-ideas singly. The problem of the modern world is the combination and adjustment of them to make a complete and sufficient basis for a permanent human society.

The Roman was the last effective civilization of the ancient world—the last one able to impress its idea upon the world that was to be. And its idea, the idea of an effective human organization, was developed in such imposing grandeur that, during the long centuries which followed its downfall, that idea still dominated the hearts and thoughts of men. The efforts of the Middle Age were for the most part pathetically ineffective. They were like

the efforts and struggles of men in dreams. But the dreams of the Middle Age were true to its own nature and character; they were grandiose, romantic. And at the heart of them all was the Roman universality—the conception of an all-embracing unity. During that feverish night and troubled dawn the Middle Age had three such splendid visions. And though they came sadly short of realization in actual practice, those dreams were truly prophetic, and are still to us of these latter days the hope and the promise of the world. The first was the dream of an all-embracing unity and organization of spiritual life—a church of which every man born into the world should be a member—the Holy Catholic Church. Its second was the dream of a world-embracing civil order of which every man should be a citizen,—the Holy Roman Empire. And the third, its dream just before dawn, and so, according to the old belief, destined to a nearer fulfillment, was the dream of a world-wide fraternity of the sons of light—of souls whom the truth had made free—the University. The conception of the University was that of a State—a *civitas*, as its diplomas still attest; a republic not of this world, but of the world of ideas. Its local institutions were to be but chapters of a universal society. Its members were to be really free as were no other men. By virtue of their common language they were actually free from the heavy curse of Babel. By virtue of their superior illumination which should make them a law unto themselves, they were to be actually free in large measure from the trammels of the civil law, made only for knaves and fools. And, best of all, their spirits were to be free—free to think, to learn, to know.

But when the modern day at last broke, organization and civilization had to begin on a scale much smaller than that of these dreams. For many centuries the nation was to be the largest whole with which human effort could successfully grapple. As the modern nationalities one after another emerged from chaos, each was forced to work out its own civilization very much by itself. Each had to make

its own adjustment of these master-ideas under its own peculiar conditions, and in accordance with its own peculiar genius and limitations. And nations differ not merely in natural gifts and advantages, but in age and in experience as well. Germany, Italy, and Japan were born into the family within our remembrance. Furthermore, the very virtues of nationality,—loyalty and patriotism,—operate as barriers to sympathy and the free play of ideas quite as much as do the commercial and material discriminations which national competition imposes. It is plain, therefore, that in the present—the national—stage of civilization there still is, and must be, much that is separative, divisive, partial. And yet in spite of the provinciality, the jealousy, the Philistinism of our modern world, one feels that civilization, wherever it now exists, is after all *one*, and not many as was the case in the ancient world. And there have been of late intimations not a few that the growth of the free spirit of man cannot much longer be kept within the limits of the national phase of organization. Such limitation was indeed necessary, and has been of immense advantage at the start. The nation was the seed-bed, the nursery; but the field is the world. Beyond the nation on every side stretches humanity itself, transcendent, limitless. Civilization can never be complete or perfect for any until all are partakers. The separate seed-plants must grow to touch and support one another, must cover the whole earth with their shadow before the golden harvest can really ripen or be gathered.

This it was toward which the dumb heart of the Middle Age so strangely yearned, and which for one group of men it so nearly realized in its University. This it is which for the same group is now realized in the almost absolute community in spirit of the truly cultured and learned throughout the world. This idea was the vital and lasting element in that profound and far-reaching stir of human life which we miscall the French Revolution. This is what prompted the wonderful missionary activity of the century just closed.

This it is which in recent times has caused a constant enlargement of the realm of international law and of international activity and coöperation of all sorts; such as the federation of the Australian Colonies just consummated. This is bringing about the gradual dawn of a world-consciousness and a world-conscience, as seen in the Red Cross Society and the Peace Conference at the Hague. But not less significant and impressive than these was the prompt and instinctive rallying of all the great powers of civilization as one man to meet the emergency in China. That emergency portended no appreciable danger to those great powers as separate nations, for it could not reach them;—much less a danger to their united force. But the Boxer movement, by its determined stand against intercourse and against ideas, far more than by its lawlessness and violence, was a menace and a defiance to the spirit of civilization itself. This, I take it, was the real issue, and this the ground of that unexampled unanimity of impulse which astonished the world. The true significance of that common impulse is not, in my view, altered at all by the greed and violence on the part of civilized nations which goaded into frenzy those unhappy people, and so precipitated the event, nor by the pillaging and wanton cruelty which seem to have disgraced the military operations, nor even by the selfishness which now seems certain to determine the immmediate outcome. That the instinct of civilization should so assert itself,—should, though for one brief moment, so overshadow national jealousies and self-seeking,—is indeed memorable, prophetic.

Such, all too hastily and meagerly set forth, are some of the thoughts which come surging to mind as one turns to gaze upon the solemn pomp of the great year just past, and listens to its trumpet-note still echoing to remind us that "the old order changeth, yielding place to new." It is much to have lived through such a year with heart and soul at all awake to its true import. It is more to have come, as most of my readers have done, to such a year as the

climax and crown of a long procession of such years of ever-increasing volume and power;—years watched with eager interest as they swept grandly by, and still vividly real in memory and imagination. But happiest of all is the lot of those who, having looked with us as from Mt. Pisgah upon the promised land, are also privileged to enter in and possess it. The Century is dead. Long live the Century! Be it for us longer or shorter, from memories and musings such as these we turn with new courage to the hope set before us—the hope of a new world.

"Clasp, Angel of the backward look
And folded wings of ashen gray
And voice of echoes far away,
The brazen covers of thy book;
The weird palimpsest old and vast
Wherein thou hid'st the spectral past;
Where closely mingling pale and glow
The characters of joy or woe;
The monographs of outlived years
Or smile-illumed or dim with tears.
Even while I look, I can but heed
The restless sands' incessant fall,
Importunate hours that hours succeed,
Each clamorous with its own sharp need,
And duty keeping pace with all.
Shut down and clasp the heavy lids;
I hear again the voice that bids
The dreamer leave his dream midway
For larger hopes and graver fears:
Life greatens in these later years,
The century's aloe flowers to-day!"

THE LITERATURE OF CHINA.*

By John Fryer.

On a previous occasion this Association listened to a paper on the Chinese language. With that as a basis we are in a position to enter upon a sketch of the very ample and discursive field of Chinese literature.

There is a great variety of opinion as to the value of the wonderful books of the Chinese, which have formed and confirmed the national taste and have exercised an influence which is without parallel in the world's history. One writer tells us that "untold treasures lie hidden in the rich lodes of Chinese literature"; while another, on the contrary, informs us that "it is only a barren wilderness." One finds in it "eloquence and poetry enriched by the beauty of a picturesque language, preserving to imagination all its colors," while another meets with "a tedious uniformity, wanting in accuracy and unenlivened by humor."

The truth we shall doubtless find to lie between these two extremes. We must not expect to discover any information of much practical value to the present age; but if we take an interest in the history and growth of a civilization in all its various departments on entirely different lines from our own, and wish really to understand and get to the heart of this ancient and wonderful people, we can thoroughly do so only by making the careful

*Read before the Philological Association of the Pacific Coast, at Mark Hopkins Institute, December 28, 1900.

acquaintance of their literature, which is the depository of all they believe to be worth knowing.

Whatever value we may place upon them, we cannot take a comprehensive view of these long-continued literary efforts without realizing that they are a key to the inner life of a great people, and as such are worthy of our respect if not of our admiration.

There are two things which strike our attention at the very outset. One is the enormous bulk and amount of this steady accumulation of upwards of forty centuries. One catalogue of the old standard works, excluding novels, Buddhist translations, and all works published within the last century or two, gives an account of 93,242 separate works, and is itself contained in 112 octavo volumes. Since this old catalogue was compiled the additions to the literature of China have been on the same gigantic scale. About half a century ago printing from movable metal type was introduced, and this was followed by lithography and photo-lithography; so that China is now deluged with books of all sorts and descriptions, and modern Chinese literature has received an impetus that has caused large book shops to be started in all the larger cities and towns. Their shelves are bending beneath the weight of new publications as well as reprints of all that are deemed the best books handed down from ancient and mediæval times.

Another thing that forces itself on those who take up the study of Chinese literature is the regret that it is all written in the language and style of the learned, or the classical language—a language that requires years of patient toil for even an intelligent Chinaman to master;—and a style which is about as remote from the language of everyday life as Latin and Greek are from English. Fortunately the tendency of modern times is in the direction of a popular and easy Chinese style; and this has been necessitated by the growing demand for newspapers and periodicals as well as for general literature—which have to be written in a manner easily understood by the majority

of readers, so as to ensure an extensive and ready sale. The time is not far distant when the ancient classical and other works will be translated and published in the language of everyday Chinese life, just as we have our Bible and the best Roman and Greek authors translated into English for those who cannot read them in the originals. Yet we may be sure that the original text of the Chinese classics will never be lost sight of, but will be carefully studied by all whose means and leisure will permit them to do so.

No one can well deny that the Chinese are eminently a literary people, although their literature takes such a widely different form from ours. We find that from the very dawn of their civilization they have been noted for their literary abilities; and their literature justly ranks as among the oldest in the world. The causes that have led to their careful and widespread cultivation of literature are various; but the chief of them is because it is made the foundation upon which the whole of their social edifice rests, rather than, as among ourselves, an ornament which graces it. The whole government system of the Empire is professedly regulated in accordance with the books and maxims of the ancient sages. Knowledge of the classics and the ability to write discourses upon them became the road to power, to wealth, and to greatness. The *literati* are the gentry, the magistrates, the governors, the diplomatists, and the ministers of China. When a parent urges his son to diligence in his studies, he can tell him with truth that he may thus become a high official. The government has for untold centuries been practically in the hands of those who have sprung from the common people, and who by means of literary pursuits have climbed the ladder step by step until they stood at the highest point of influence and honor. The Chinese have their list of their Lincolns and Grants and Garfields who have risen to greatness; but it is vastly longer than ours because their country is so much older.

With such strong inducements is it to be wondered at

that the Chinese have devoted a great amount of time and energy to the cultivation of their literature, and that they have attained a high standard of excellence in the particular branches to which their attention has been directed?

The countless volumes which have appeared and are still being published in all parts of China may be regarded as a mirror reflecting the national mind, the temperament of the people, their peculiarities, their excellencies, and their defects. Only such studies as commend themselves to the national taste are pursued to any extent; but in these they have shown the greatest diligence in research and activity in compilation. The results of their labor, however, all show a deficiency in the faculties of imagination and invention, as well as an inability to run beyond a certain degree of excellence or knowledge. Philosophy and history are their strongest subjects; but even in these there has been but very little progress in thought and style for two or three thousand years.

The cultivation of literature by the Chinese is an indirect means to an end, *viz.*, official position and employment; rather than, as it ought to be, for the direct benefits of its mental and moral discipline and enlightenment. Hence their attainments in literature do not correspond either to the importance they attach to them or the distinctions they confer. New opinions, new systems of philosophy, new forms of government, new theories to account for the existing state of things, new possibilities to which the nation ought to direct its energies, and a hundred other questions which in Europe and America would become subjects of the liveliest general discussion or interest, have been left almost entirely alone in China. In a nation almost always in fear of political agitation and jealous of innovation, any departure from the old paths and the well-known landmarks is at once deprecated and strongly opposed. Hence, wonderful as their literary labors have been in the past, the Chinese have been left far behind by the nations of the West; and their choicest works, embody-

ing the wisdom of thousands of years, contain perhaps but little that can be regarded by us as instructive or profitable for the present age. One by one their crude discoveries in science and art have been taken up, carried forward, and elaborated in the West, until their utmost limit of benefit to the human race has apparently been reached; or, at any rate, has been defined. In the same way the finest portions of their literature contain but little that has not already been expressed by Greek or Roman philosophers or those of more modern times, although it may appear in a somewhat different form.

Perhaps the best way to obtain a just view of what Chinese literature is as a whole is to compare it with our own of a few centuries ago. Take, for instance, the immense historical works or dynastic histories consisting of thousands of volumes; the still larger and more detailed works on geography and topography; the enormous encyclopædias, such as the one in 1672 volumes which I have in my library; or the very comprehensive materia medica; and they will all compare very favorably with the best of those we had in Europe at the time they were written, or at which they had already become standard works in China—say five hundred to one thousand years ago. Remembering at the same time the isolation of China and the want of the vivifying influences of the competition of other countries pursuing the same researches and branches of knowledge, one cannot help admiring the comparatively unaided results she has achieved. Still more one may give way to one's fancy and wonder what, with her patient toil and passionate ardor for literary pursuits, might have been the result had China possessed all the advantages we have been blessed with in the West. What few chances she has had, however, when once understood and appreciated, have been readily accepted and made use of; as for instance the teachings of Buddhism and the scientific instruction given by the Jesuit fathers. Even now Chinese literature is being enriched more and more every year by translations and compilations from standard works of Western authors.

When we further consider the unsettled state of the government; the frequent changes of dynasty; the five great literary catastrophes, by each of which the previous accumulations of literary effort were almost wiped out; the discouragements that have so often been placed in the way of progress; the conservatism and national pride, the self-contained and self-sufficient spirit which her unique position in the world has brought about, we may well look with astonishment on the vast literary achievements which China has been able to accomplish under so many difficulties and disadvantages.

From the above facts we can easily see that although the literature of this nation has failed from many causes to attain any high distinction in the world at large, and has been unable even to begin to rival the depths of thought and the flights of genius which characterize that of the West, it has still a very great claim on our attention. It is the literature of a vast portion of the human race. It covers the results of the labors of thousands of literary men of high attainments which have been accumulated through thousands of years. The very fact of its breathing an entirely different spirit and being developed in entirely different forms from our own literature has prevented it from becoming a popular study among us. Further, it is of little if any practical value to this utilitarian age. We can take it up only as a subject of deep interest and curiosity, throwing a certain amount of light upon such studies as history, archaeology, philology, ethnology, and kindred branches of research.

The so-called "Celestial Empire" requires very peculiar and special treatment by foreign powers, who can do themselves and China full justice only by obtaining a clear understanding of what is embodied in her literature, and what she holds forth in it to be the highest and noblest features of character that are worth striving for. It is by this standard the Chinese judge themselves, and they expect us to come up to it.

We may here ask as to the method of classification of Chinese literature. In the T'ang dynasty all existing literature was arranged under the four divisions of the classics, the histories, the philosophies and arts, and polite literature and poetry. This arrangement is the one that has been in use up to the present time. These main divisions are so numerously subdivided that a mere list of them would occupy several pages. Even a resumé of the whole of the vast field thus covered would be impossible in the narrow limits of the present paper. It is sometimes difficult to understand the reason of the systems of classification pursued by the Chinese. But their system of division seems to work satisfactorily with them, and is to be found in the Imperial Library, in large private libraries, and generally in large book-publishing and book-selling establishments.

Let us now suppose ourselves to be paying a brief visit to a large Chinese library, and as we pass through its four principal departments let us take down and examine here and there a work in order to get a good general idea of the whole range of the national literature. We shall find that Chinese books are generally bound up in volumes from a quarter to half an inch thick, the covers being of soft paper and fastened with silk threads. They are piled up horizontally on the book-shelves, which are labeled with the class or division that the book belongs to. A paper label hangs down from the first volume of each separate work to facilitate research.

(1) We first come to the department of the classical writings, which occupy the foremost position in the Chinese mind, not only on account of their great antiquity, but also because they are regarded as the foundation of all learning, and are the basis upon which a large proportion of the magnificent structure of Chinese literature has been erected. The Chinese classics consist of the five "King" or canons, and the "Four Books." They have been compared to our five books of Moses, and our four Gospels. These various classical writings, reaching back in some instances to three

or four thousand years, have all been commented on in extreme detail by various ancient and modern men of note. But the commentary published by imperial command is the only one allowed to be bound up with these classics and studied in connection with them. This commentary gives tone and color to the ancient text, and without it many parts would be of doubtful interpretation. One feature of these commentaries is the utter absence of anything like a religious spirit. They are atheistic or materialistic in character and tendency, and this does not accord with the ideas of the more ancient classical books.

Under the head of classical works the Chinese reckon their various dictionaries, in the compilation of which a vast amount of labor has been bestowed for the purpose of maintaining the purity of the language. The noted Kang-hsi dictionary, giving the sound, meaning, and use of forty thousand or more words, compiled under the direction of the Emperor Kang-hsi toward the end of the seventeenth century A.D., belongs to this division.

(2) We must now pass on to the second department, containing the historical writings. Under this great division are the four principal classes of history, biography, geography, and topography, with many others too numerous to describe.

The historical works of the Chinese are one of the most important features of their literature. First came the dynastic histories, compiled dynasty after dynasty after a general plan. These take up the imperial records, the arts and sciences, and the biography of eminent men. The latest compilation is called the "Twenty-four Histories," comprised in three thousand two hundred and sixty-four books by twenty-four different authors, commencing with the Herodotus of China, named Sz-ma-ch'ien, whose writings cover the period from remotest antiquity up to 122 B.C. This work is undoubtedly the largest history that has ever been compiled, and terminates with the end of the Ming Dynasty. Other voluminous authors have written the his

tory of the present dynasty on the same grand scale. One of the saddest acts of vandalism on the part of the defenders of the the British Legation at Peking during the recent siege was the destruction of the historical records stored in the Hanlin, or Imperial Academy, on the north side of the Legation. These can of course never be replaced. We can only pause to look with astonishment upon the voluminous and exhaustive works of reference on the three important subjects of biography, geography, and topography.

(3) We next come to the third department, where we find the philosophies and arts. This is made to include religion with the sciences and is thus very comprehensive. Many original thinkers are to be found among the Chinese philosophers of past ages who propounded very different views from those of the early sages. Most of their works are still in existence, and in some of them we find ideas that saw the light of day in China long before they were ever dreamed of by our Western moral philosophers. Moral philosophy has been a favorite theme among the Chinese from the earliest times. Some of their writers are as much to be admired for the style of their compositions as for the sagacity of their systems. The most modern classification of these so-called philosophies and arts is under fourteen divisions. Each of these divisions is still further subdivided; and so it is throughout the library. But time will not admit of an extended notice of the fine collections of works in this great department, in which astronomy, medicine, legislation, novels, agriculture, mathematics, and enormous encyclopedias are prominent features. The Buddhist and Taoist works alone are more than enough reading for a whole lifetime.

(4) We pass on to the fourth department, which is the drama and poetry. This is the last and by far the largest of the four great divisions of Chinese literature. With regard to Chinese poetry we find that the Chinese have been lovers and worshipers of nature from the very earliest

times. Long before we in Western lands awoke to all the charms and beauties of the creation, and began to express them in song, the Chinese had been accustomed to manifest their passionate love of nature in verse of a high order of literary merit. The art is still pursued with ardor and held in the highest esteem. A thorough acquaintance with it is considered essential to those who seek public employment; as it forms an important feature in their examinations. The adherence to ancient poetical laws has been a cause that has checked the attainment of a high standard in modern times.

Unfortunately we cannot translate Chinese poetry so as to bring out its original meaning. The sparkle of wit and the points of allusion are lost to our inappreciative Western ears. The rhyme and rhythm disappear, and the finest Chinese poetry becomes the tamest prose, with its spirit and imagery all gone. If we attempt to translate it in a metrical version and clothe it in appropriate language, the original character of the composition becomes entirely changed. The very terms consecrated to poetry are altogether different in the East and West. For instance, our Alps and Appenines change into the "Kwan-lun" and the "T'ai-shan;" our rose and violet are represented by the epidendrum and the hibiscus; while the wild goose is the image of a tender and faithful lover, instead of the dove as among ourselves.

Chinese poetry does not partake either of the epic or of the pastoral description; but with these exceptions we find all the classes that we have in the West. The poems are all more or less short and deserve rather the name of odes and songs, many of them resembling somewhat the shorter compositions of Cowper and Wordsworth. Their theme is generally a combination of some of the grand or beautiful objects of nature, with reflections or descriptions of the existing state of public affairs, or of the peculiar condition of mind of the poet.

Poetry flourished most in the T'ang dynasty, in the

ninth and tenth centuries, which have been described as the Augustan age in China, of poetry and letters. The collected poems of the T'ang dynasty have been published by imperial authority in nine hundred volumes.

The object of all regular poetry seems to be to conform as closely as possible to the very stringent rules of the art, and to make the diction as perfect as possible;—the thought or sentiment being only of secondary consideration. The country being flooded with poetry manufactured in this perfunctory way by people of whom not one in a thousand has the poetic gift born in him, the national taste has reached a very low ebb, and China for many centuries past has not produced a poet of any renown.

The drama, as one would easily imagine, is a popular form of Chinese literature, although it labors under very great disadvantage. The profession of play-actor is regarded as one of the very lowest. Theatrical performers, butchers, and barbers with their descendants to the third generation are associated together as unfit to be allowed to sit for government examinations, and to attain literary honors. Under such humiliating circumstances China can boast of no national dramatists. Numerous pieces, however, have been produced, especially in the dynasties of T'ang and Yuan, and a collection of plays is in common use amounting to one hundred, called the "Hundred Plays of the Yuan Dynasty," which is supposed to contain the most renowned efforts of ancient and modern times. Some of these have been translated into English or French.

Chinese classify all dramatic performances as "Wen," or literary, and "Wu," or military. The former class which faintly resembles the plan of the historic plays of Shakespeare, is never very popular; while in the latter the fierce, rough representations of fighting, intrigues, quarrels, etc., interspersed with songs and by-plays which are often of a very objectionable character, seem to find the most unbounded popular favor.

In this hasty sketch of the works usually found in a

Chinese library, we have confined our attention so far only to the standard books which are universally accepted by the highest authorities. But it must be remembered these form only a very small portion of the whole literature of China, which it would take a course of a dozen lectures to begin to do full justice to. In China, equally as much as in America, the words of King Solomon find their apt fulfillment, "Of making of many books there is no end." Those who would like to pursue this subject further will find the excellent treatise of Professor Giles of Cambridge University, England, entitled "A History of Chinese Literature," of especial value. It is just about to be published by D. Appleton & Co., of New York.

THE DEVELOPMENT OF THE PETROLEUM INDUSTRY.*

By Edmond O'Neill.

The most remarkable achievements of the nineteenth century are those of science, and in this work the chemist plays no mean part. If the chemist were asked to name a single substance that would epitomize the development of the applied chemistry during this time, he could easily say petroleum. Not that its technology is greatest in money value or necessity to man, but it is essentially of the nineteenth century. Iron, steel, copper, cement, dye-stuffs, sugar, starch, soap, and many other measures of the degree of civilization, have been prepared on a large scale for centuries. The petroleum industry was born barely forty years ago. Heat and light are absolute essentials for our modern civilization. Petroleum furnishes both, and not only does petroleum furnish the foundation, but the superstructure is, to a large extent, made up of petroleum products.

The modern organic chemistry, with its countless compounds, may be said to be the chemistry of petroleum products; dye-stuffs, perfumes, germicides, all have petroleum derivations as their bases. The modern pharmacopeia bristles with names of preparations that are warranted to cure any of the equally numerous modern diseases. And

* Read before the Science Association of the University of California March 13, 1901.

yet we stand only upon the threshold of the new synthetic chemistry. No one can tell what the future will bring forth. We only know that in petroleum we have the raw material that will enable us to solve the unending problems.

We say that the petroleum industry is but forty years old. The substance itself has been known from time immemorial. Ages ago the Chinese employed it for evaporating brine; the Egyptians used asphaltum and other petroleum products for embalming. Herodotus, 500 B.C., describes certain rock oil springs in Zante. Plutarch mentions that a burning oil occured at Ectabana. Pliny and Discorides relate that illuminating oil was obtained at Agrigentum in Sicily and that the different springs yielded different varieties of oil, some so volatile as to be dangerous when used in lamps. The sacred fire burned for ages in Baku and in Burmah. Marco Polo describes various places where oil occurred. In America, it was no doubt used by the Indians long before the landing of Europeans. The first mention of its use in this country is in Sagard's Historie du Canada, published in 1632, where it is related as occuring in what is now Allegheny County in New York and as being used by the Indians as a remedy for bruises. This same oil was sold for a long time for such purposes, under the name of Seneca oil.

From 1790 to 1820 numerous wells were dug along the western slope of the Alleghenies to obtain salt water, this brine being afterwards boiled down for salt. Sometimes a small amount of petroleum would accompany the brine, often in sufficient quantities to spoil the salt. Occasionally more oil than water would be struck, as, for instance, in one well dug in Kentucky in 1819 which still yields petroleum. Another one in Cumberland County, Kentucky, flowed in sufficient quantity to cover the Cumberland river; it became ignited, and the river was on fire for a distance of fifty miles. This was the first flowing well in America.

Numerous attempts were made to exploit these springs and obtain oil in large quantities, but were for a long time

unsuccessful. The wells that were dug were shallow and never yielded more than a small amount. One company, the Pennsylvania Rock Oil Co., organized in 1854, prospected for two years and then became discouraged. A few stockholders persisted, however, and employed Colonel E. A. Drake to continue the work. On August 29, 1859, he obtained from a well four inches in diameter and sixty-nine feet deep a flow of oil amounting to 880 gallons daily. It created great excitement. Hundreds of men instantly flocked to the region and numerous wells were dug. In 1861 a man name Funk drilled the first large flowing well. It yielded 100,000 gallons a day, and shortly afterwards another one near by of equal capacity was struck. The excitement increased tremendously. Where hundreds prospected before, there were now thousands, and oil wells were located over a large area in Pennsylvania, West Virginia, and Kentucky. Many yielded large flows and some of them are still profitable. Enormous fortunes were made and lost, but the industry increased until in 1880 the amount of oil produced in Pennsylvania alone amounted to 200,000,000 gallons annually. In 1884–85 the Ohio fields were developed, and the production of oil was greatly increased. In 1885 the entire yield of the United States amounted to 22,000,000 barrels of forty-two gallons each, valued at $20,000,000. The entire production in all other countries at this time amounted to 14,000,000 barrels, valued at only $2,500,000. Most of this was produced in Russia.

In 1893 the entire United States production was 48,412,666 barrels. The entire production in other countries was 84,330,804 barrels, of which Russia produced 33,000,000 barrels.

The enormous profits of the industry led to prospecting all over the United States and in many other countries. Oil was found to be very widely distributed. It has been found in quantities in Pennsylvania, West Virginia, Illinois, Indiana, Ohio, Kentucky, Texas, Arizona, New Mexico, Colorado, and California, and in small amounts in nearly

every state in the Union. Other countries which produced petroleum in larger or smaller quantities were Canada, Peru, Chili, Brazil, Trinidad, Barbadoes, Porto Rico, Mexico, Italy, Gallicia, Roumania, Bavaria, Austria Hungary, Alsace, England, Russia, Japan, China, Burmah, India, Persia, and Africa. Indications are present in practically every part of the earth's surface. In some of these regions the production has reached very large proportions, notably in Russia. The occurence of oil in Russia has been known for a long time. Gas wells have burnt at Baku for centuries. In 1873 the region was systematically exploited by the Rothschilds.

Some of the Russian wells are enormous yielders, 50,000 barrels a day being not unusual. Some produce 100,000 barrels a day. The Tagieff well near Baku yielded nearly 3,000,000 gallons a day, over 11,000 tons. It spouted 224 feet from a ten-inch casing. Nearly 10,000,000 gallons were lost before it could be controlled. Something like this, though in a lesser degree, occurs in all oil regions. A 1000-foot well near Sabine Pass has flowed 600 to 800 barrels an hour; it spouted 175 feet, but most of it was lost. A California well has yielded 3000 barrels a day. A short while ago an Indiana well flowed 7000 barrels a day, but it was exhausted after a few days.

The history of petroleum in California is exceedingly interesting. Mr. W. L. Watts has made an extended study of this subject, and from his report to the State Mining Bureau, many of the facts regarding California petroleum were obtained. As in all other countries, its existence was known for a long time. The Indians employed it as a liniment. The Mission Fathers used the asphaltum for roofing purposes. In 1852 a small amount was distilled by Pico for illumination purposes. In 1855 a relatively extensive plant was established by Morrell in Santa Barbara, but the product was not very good and the manufacture soon ceased. The Eastern oil excitement of the sixties spread to California, and in 1865 there had been

formed sixty-five companies with a nominal capital of $45,000,000. Many of these companies sold shares at high prices: $1000 per share was not uncommon and $1500 a share was sometimes paid. Glowing prospectuses were issued and many unwary speculators invested. Some of the accounts given were very amusing; for example, it was said that the ranchers of the region found the oil objectionable, as hundreds of cattle were mired and drowned in the oil exuding from the springs. This probably had reference to the asphaltum beds.

One company was exploited as follows: 10,000 acres were bought for $22,000 in greenbacks, equal to $10,000 gold. One-half was sold to Eastern speculators for $50,000. This was resold for $450,000 and then went as $10,000,000 into the assets of the California Petroleum Co., which was advertised to have twenty natural oil wells of the largest size. Another company advertised that Spring No. 1 contained 144,500,000 gallons of oil actually in sight. Ten of these wells would yield in twelve months $5,460,000. A man digging in a swamp dug up some mud that smelled of petroleum. A company was immediately capitalized for $600,000. Oil properties were exploited in every county from Humboldt to San Diego. Fresno and Kern counties, what are now Coalinga, McKittrick, Sunset Districts, etc., were all prospected, but there was no permanent success.

The cause of the failure is easily seen in the light of subsequent developments. In the first place most of the companies were not *bona fide*. They existed on paper only and were formed for stock selling purposes alone. In the second place, the prospecting was not thorough enough and the wells not deep enough and very little oil was obtained. Thirdly, the oil obtained was very different in quality from the Eastern oil. It yielded practically no oil good for illumination, which at that time was the only use for petroleum. Fourthly, many scientific men of the day, notably Clarence King and J. D. Whitney, at that time State Geologist, pronounced the oil of no value

whatever, which was true as far as knowledge went at that time. In the fifth place, the supply was so small and uncertain that no demand could be created. All these influences combined gave a setback to the industry and it languished until 1887, when, according to the report of the State Mining Bureau, there were only four companies in operation. These companies were the Pacific Coast Oil Co., in Pico Cañon; the Puente Oil Co., in the Puente hills, in Los Angeles county; the Hardison-Stewart Co., afterwards the Union Oil Co., in Ventura county; and the McPherson Co., in Moody Gulch, in Santa Clara county.

The discovery of oil in Los Angeles in 1892 gave an impetus to the business. With an increasing supply came an increasing demand. Other districts were developed and it was shown that a large supply existed. This increased the demand and a ready sale resulted. In addition to this, was the probability of suddenly acquiring great wealth. The gambling spirit siezed hold of the community and many people were eager to invest. Company after company was formed and an enormous amount of prospecting was done. Up to the end of last year over thirteen hundred companies had been incorporated with a nominal capital of about $400,000,000.

Of course, many of these companies have not drilled a single well, but in the aggregate a very large amount of work has been done and the state bids fair to be thoroughly prospected. To get a clear idea of the present condition of the oil industry on this coast, it might be well briefly to consider the development in the different districts.

Petroleum seems to occur along the entire western slope of this continent. It has been found from Ecuador and Peru in the south to British Columbia in the north. In California it has long been known, and, as has been mentioned, was used by the Indians and Mission Padres. The immense deposits of asphaltum in the southern part of the state, and gas wells and oil seepages in other localities were almost certain indications that large amounts of

petroleum were buried beneath the surface. Desultory attempts were made at various times to develop this supply but with little success, until about 1875, when a company began to develop the Pico Cañon, in what is now known as the Newhall district. After passing through various vicissitudes it was finally in 1875 merged into the Pacific Coast Oil Co., and operations were conducted on a large scale. Many wells were dug, a pipe line forty-four miles long was constructed to the ocean at Ventura, and a large refinery built at Alameda Point. A tank steamer is used to carry the oil from Ventura. About 1883 the Hardison-Stewart Co. began operations on a large scale in Ventura county and later on combined with various other companies to form the Union Oil Co. This is also a large corporation with many wells, pipe lines, and a refinery at Oleum in Contra Costa county.

These two large companies did much to develop the industry then and showed that oil was present in considerable amounts over a large area in Los Angeles and Ventura counties. The next step in the development was the discovery of oil in the city of Los Angeles in 1892. This region, in common with many others, had been exploited in the sixties. A well was dug in 1863, but no oil was obtained. They did not go deep enough. In 1892 oil was obtained from a well about 375 feet deep. It created great excitement. In three years more than three hundred wells were drilled and most of them yielded oil. Other districts in the neighborhood were exploited and hundreds of new wells located. The production of oil rapidly increased until in 1897 it had reached 1,400,000 barrels. It then began to decline but still amounts to 1,200,000 barrels annually. The total amount of oil obtained from the Los Angeles district amounts to over 7,500,000 barrels. About 1400 wells have been bored, but only about half of them are now pumped.

Other districts in Los Angeles county have been worked for oil, the principal ones being Whittier, Fullerton, and

Puente. None of them have been as profitable as the Newhall or Los Angeles. Puente is the best. This oil is very light in gravity, so much so that most of it is distilled and only the residium used for fuel. In Ventura county there are more than eight hundred wells, only about half of them being worked now. They are from 500 to 2000 feet deep. Practically all are owned by the Union Oil Co.

In Santa Barbara county oil seepages have long been known. In 1895 some wells were dug on the beach at Summerland and oil was struck at the depth of only 125 feet. Since then about three hundred wells have been bored, some on the beach and some in the ocean, 400 to 1200 feet from shore. Some of the wells are 1000 feet deep. The oil is heavy, averaging about 14° B. The yield is about 14,000 barrels a month. The Fullerton District, in Orange county, does not produce much oil as yet, although there are some one-hundred-barrel wells. The oil varies greatly in gravity, from heavy 14° to as light as 35°.

North of Tehachapi, the whole valley of the San Joaquin seems to be underlaid with oil, although as yet only a small area is worked. The principal fields are in Fresno and Kern counties. In Fresno county is the well-known Coalinga district. Prospecting was begun here in the early nineties and in 1895 oil was struck in paying quantities. One famous well in this district is the Blue Goose, now belonging to the Home Oil Co. This was dug by two men who were hardly possessed of a dollar when they began. They obtained their materials on credit and did all the work themselves. Many a time they were inclined to give up. Some of their friends scoffed at the idea of their obtaining oil at that point. They persisted and their efforts were rewarded by a flow of 3000 barrels a day, and the well still yields over 700 barrels a day. The Coalinga field is, however, very limited in extent, extending over very little more than three sections, but in this limited area there are nearly fifty wells. Some are very deep, one being 2300 feet. The oil is of two qualities;

one very heavy and black in color, the other very much lighter, about 35° B. There are two pipe lines to transport the oil to the railroad. Another district in Fresno that has produced some oil is Kreyenhagen, twenty-two miles southeast of Coalinga. Like Coalinga, it produces two qualities; one green, light, 35° B., and one black and heavy, 14° B. Other districts have been prospected, but they yield little or nothing.

In Kern county we come to the largest field that has yet been discovered. The story of this field reads like a fairy tale. The land was a desert, forbidding, barren, and valueless. The alternate sections of government and railroad lands were not taken up to any extent, for no one thought they were worth taking up. And so strong is prejudice that little of the land was filed on by the residents even after it was demonstrated that it contained petroleum. Most of the developing was done by outsiders and it was they who reaped the reward, and the reward in some cases has been enormous. Land that could have been filed on for nothing or paid for at the rate of $1.25 or $2.50 per acre is now worth and is sold for $1000 to $6000 per acre, and $10,000 has been paid. Land which two years ago hardly anyone would take as a gift is now producing an income that is equivalent to 5% on $40,000,000. And the probabilities are that the yield will be greatly increased. It was in April, 1899, that J. F. Ellwood, having noticed a few bubbles of oil in the water, dug an ordinary well with pick and shovel for seventy-five feet, and then with an auger struck the oil sand. The discovery was first received with indifference, but gradually the knowledge that the field was extensive spread. People collected in Bakersfield in such numbers that it was difficult to get accomodations. And this difficulty still continues. A great number of wells were drilled and many more would have been developed if it had not been for the inability of the prospectors to get men and rigs and piping. Of the large number of wells dug, some are good producers. One-hundred-barrel wells

are not uncommon, and some give more. Many yield little and a number have produced nothing. The yield has now reached about 12,000 barrels a month, and will probably increase greatly. Oil ranges from 9° to 22° and sometimes carries much sand. The transportation is difficult.

Another part of Kern county where petroleum is found is the McKittrick district. Here are large deposits of asphaltum that are worked by the Southern Pacific Railroad. They have built a branch road sixty-five miles long, terminating at Asphalto. This district contains a few good wells, but many are useless. Some give very large amounts of water. The oil is light, about 33°, and the yield is about 10,000 barrels a month. A third district in Kern county is the Sunset. This has also been worked for asphaltum for nearly ten years. It has lately been developed for oil. Over fifty companies are operating. Some have good wells, as much as one hundred barrels a day, but many are barren. Nearly all are troubled with fine sand that caves in and chokes the wells and also remains in the oil. There is a great lack of water, and what there is is usually salt or alkaline. Most of the oil is heavy, containing 30% to 50% of asphaltum of good quality. The asphaltum is sometimes more valuable than the oil, owing to lack of transportation facilities.

The foregoing are the districts that produce practically all the oil in California. But it has been found in greater or less quantity in almost every county, and also in parts of Oregon, Washington, and British Columbia. Some of the counties in which prospecting has been carried on extensively in addition to the southern counties already mentioned, are San Diego, Santa Clara, San Mateo, San Francisco, Alameda, Contra Costa, Napa, Sonoma, Colusa, Yolo, Mendocino, Humboldt, and Shasta. Some have dug very deep wells. Some in Contra Costa and San Mateo are 1200 feet deep. There is a well in Humboldt, in the Mattole district, 2000 feet in depth. They have all yielded a small amount of oil, frequently of light gravity.

To recapitulate, we find that oil is distributed over this entire western coast, but as yet practically the whole amount produced comes from a few districts in the southern part of the state. The following table, taken from the Report of the State Mining Bureau, will illustrate this:

	1897.		1898.		1899.	
County.	Product, bbls.	Value.	Product, bbls.	Value.	Product, bbls.	Value.
Fresno	70,140	$70,840	154,000	$154,000	439,372	$439,372
Kern	.....	.....	10,000	10,000	15,000	13,500
Los Angeles	1,327,011	1,327,011	1,462,871	1,462,871	1,409,356	1,409,356
Orange	12,000	12,000	60,000	60,000	108,077	108,077
Santa Barbara	130,136	130,136	132,217	112,549	208,370	191,288
Santa Clara	4,000	10,000	3,000	6,000	1,500	3,000
Ventura	368,282	368,282	427,000	571,000	496,200	496,200
Totals	1,911,569	$1,918,269	2,249,088	$2,376,420	2,677,875	$2,660,793

The amount produced in 1900 is much greater than in 1899, but the relative value is less. The increase is chiefly in Kern county.

As to the prospects of obtaining a larger supply, we can get a clearer idea by discussing the origin and genesis of petroleum. It is often supposed that oil exists in the form of underground lakes or pools and that a producing well is one that strikes one of these accumulations. In rare cases this may be so, but practically always we have the same conditions as in the case of water wells—a more or less porous medium, gravel or sand or sandstone, saturated or soaked with oil or water, underlaid and surrounded by an impervious wall of clay or rock, that prevents the escape of the oil or water. In the case of oil, a cap or cover of some impervious medium is also necessary, otherwise the oil will volatilize and escape. We see examples of this in the deposits of asphaltum, which are probably residues of petroleum from which the volatile part has been evaporated. When the porous medium containing the oil is made up of pebbles or very coarse gravel, the interstitial space is very great and such gravel will contain much oil, and a well bored into such a layer will yield large amounts. This is the case in the Russian wells where the oil sand is made up of coarse pebbles. Some of them are tremendous yielders—

50,000 or even 100,000 barrels a day. Where there is coarse gravel the yield is correspondingly reduced but is still very large, as instanced in the Matthews and Mervy wells in Pennsylvania, that have yielded 15,000 barrels a day. Another reason for the large yield of oil in the coarse gravel or pebble wells is that the oil flows easier and more rapidly than in fine sand or sandstone, and can be pumped out more rapidly.

In California most of the oil sand is very fine, and is sometimes cemented into a brittle sandstone. Such wells cannot be very large produeers, and as a matter of fact, most California wells yield one to two hundred barrels a day. Some are much larger, one having yielded 3,000 barrels a day, but only for a short time. The fine sand is often troublesome, causing the wells to cave in and choke up. It is frequently pumped up with the oil. Oil is usually accompanied by water, and this water is often salt or alkaline. Ordinarily, owing to the differenee in specific gravity, the water will be below the oil. When the permeable strata or oil sands are inclined, it is often a difficult geological problem to determine the most favorable place to bore for the oil; for if the locality be not properly chosen, water or gas or possibly nothing at all is obtained, although oil may be present in considerable quantities. Sometimes the profitable oil sand is very limited in area and surrounded by a large region of impermeable, barren ground. In such a case a well may be bored very close to a producing one and yet remain dry. For example, wells were dug within three hundred feet of the 15,000-barrel Mervy well, previously mentioned, yet not a drop of oil was obtained. On the other hand, a second well may tap the oil sand lower down and draw all the oil from the first well. This has frequently been done. Other things being equal, the larger the number of wells bored in a given area, the quicker the area will be exhausted. The sand contains a given amount, and if a large demand is made upon it the supply will correspondingly soon be exhausted.

And this brings us to the question, How much oil may

be expeeted from a given region; for example, California? The problem is simple enough in theory; given the area and depth of oil sands and the per eent. of oil carried by the sand, it needs but a couple of multiplications to determine the amount. As to the percentage of oil, estimates vary. In the Allegheny region, where the oil sands are composed of quartz gravel or pebbles the size of beans, the amount is about equal to 1,000 barrels per acre per one foot of sand. In California the pereentage has been estimated to be from ten to twenty-five. If we take fifteen per cent. as an average, it would be equivalent to about four hundred and fifty barrels of oil from an acre of oil sand a foot deep. Based on figures such as these, some extravagant estimates have been indulged in as to the amount of oil in California. One enthusiast says that there are 40,000 square miles of territory that almost certainly contains oil, and that the average thickness of the oil sand is 400 feet. On the above assumption there would be stored up in our state 4,608,000,000,000 barrels of oil. The production last year was about 3,000,000 barrels. If this were increased tenfold, the supply would not be exhausted for over 150,000 years. As a matter of fact the entire amount of petroleum produced in California up to the end of 1900 is a little over 15,000,000 barrels. The following table, prepared by Mr. Charles G. Yale for the State Mining Bureau, shows the production by years:

Entire amount of petroleum produced in California:	Barrels.
Previous to 1876	175,000
1876	12,000
1881	100,000
1885	325,000
1892	385,000
1893	470,000
1894	705,000
1895	1,208,000
1896	1,252,000
1897	1,903,411
1898	2,267,000
1899	2,292,000
1900	3,000,000
Total	15,094,411
1901 (estimated)	5,000,000

The supply in a given area is practically a fixed quantity, and will be exhausted sooner or later according to the demand made upon it. If a large number of wells are sunk close together, the field is relatively soon drained. If the strata are inclined, one well may take the supply of another one. This tendency to multiply wells is seen to a great degree in California, especially in Los Angeles, where the derricks are nearly as thick as trees in a forest. There is a certain proportion to be observed between area and the number of wells. If the wells are too far apart, the sand is not thoroughly drained. If too near, there is useless expense. About one well to five acres is supposed to be reasonable, but this, of course, is subject to variation according to circumstances.

The method of drilling wells is exceedingly simple. It was devised in Pennsylvania in the early sixties, during the oil excitement, and with a few modifications has been adopted in every country. A very heavy iron bar with a sharp edge is suspended and allowed to drop by its own weight, lifted and again dropped, the bar being slightly turned each time by twisting the rope. This pounding is continued until a number of feet have been drilled, and then water is admitted and the debris baled out by means of a simple pump. There are, of course, many adjuncts and adaptations, but the principle is the same in all. Ingenious tools have been devised to loosen tools that have stuck or to regain lost tools. Ordinarily the well is cased with iron pipe screwed together. This iron pipe keeps the well from collapsing and also enables the driller to admit or shut off water or oil at any desired level.

Sometimes the oil when struck is under great pressure, and will throw the tools, weighing several hundred pounds, many feet into the air, and a stream of oil will follow that may continue for a long time. Such wells are known as gushers. Their value is usually very great, not only on account of the large quantities of oil, but because there is no cost for pumping. Occasionally a well will spout inter-

mittently, usually due to an accumulation of gas. The pressure will increase until the supply of oil is forced out, sometimes with great velocity. The gas pressure is released and the oil sinks back, to be again forced out. They are in fact oleaginous geysers. Occasionally the flow of oil is so great that it cannot be controlled. Even building earthwork dams at intervals is not always effective, and much of the oil is lost. If this flowing oil takes fire it may make a magnificent spectacle, but often causes much damage, and sometimes loss of life, as exemplified a few months ago at Baku, in Russia.

The wells vary in depth from a few hundred to twenty-five hundred feet. The cost of drilling depends upon the character of the bore and the distance from the base of supplies and the character of the roads. Under the most favorable circumstances, a 1500-foot well can de drilled for $2,000 and a 2000-foot well for $2,300, a considerable part of the cost being for the casing. Usually, and particularly in California, the cost is considerably more—two or three or even four times as much. A 650-foot well in the Bakersfield district costs $2,500, and a 1000-foot well costs $5,000. But the well once drilled, there is little or no expense.

Having obtained the oil, the next problem is to transport it to market. The easiest way, and the one always used during the first stages of the development of an oil field, is to transport in barrels, usually of a capacity of forty-two gallons. The next is to use tanks, either small wooden ones transported on wagons, or large steel ones, carried on railroad cars. When navigable water is convenient, barges or steamers may be used. The usual capacity of tank cars is 150 barrels. The boat capacity is limited only by the size of the vessel. This latter is an exceedingly cheap method, and oil can be carried long distances at little expense. Some of the oil from Southern California is thus transported, and it has been brought in the same way from Peru, and also across the Atlantic. The simplest way is to transport it by means of pipe lines, and in all the large

fields hundreds or thousands of miles of pipe are employed. It varies in size from two to eight-inch, the six-inch screwed pipe being the most common in the East. Pumping stations are erected at intervals, usually of forty miles. The lighter the oil the easier it flows through pumps and pipes. Very dense oil cannot thus be transported. Very cold weather will thicken the petroleum and may stop the flow. As California oil is usually very dense and heavy, pipe transportation for any distance will be difficult and expensive. This may to some extent be remedied by thinning the oil with some distillate, but it will always be more expensive to use pipe lines for carrying California petroleums than for the Eastern oils, in spite of the warm winter weather. It costs 10 cents a barrel to transport 35° oil through a 3-inch pipe ten miles from the Coalinga district. The railroad charges 42 cents a barrel to carry oil from Bakersfield to San Francisco, with an extra switching charge, making the entire cost of freight about 45 cents a barrel. As the oil is originally worth only about 85 cents to $1.00 per barrel, transportation is a considerable item. Efforts are now being made to induce the railroad to reduce this tariff.

When the petroleum has been carried to its destination, the next step is to dispose of it. For crude oil the only large use is as fuel. Crude oil in bulk does not burn readily, especially if it is heavy. A special form of burner must be used. The usual method is to inject the oil in a very fine spray by means of steam, and the heated, finely divided particles will burn easily and completely. As the flame is exceedingly hot, it is directed on to brickwork on the bottom of the fire-box, and the boiler heated to a large extent by radiation. The advantages, especially on this coast, of oil over coal are many. It is more convenient to handle, it is cleaner, and it is cheaper. The ease with which the liquid oil is transported is much greater than with solid coal. When properly burned, there is no smoke, or soot, or cinders. There are no ashes, so the boiler tubes do not get

stopped up. Oil heating is particularly desirable for locomotive engines. Ease of loading and firing and absence of cinders, with consequent comfort to passengers, and no danger of setting fire to grainfields or fences, are self-evident advantages. In Russia nearly all the locomotives are thus run. In this state probably all the engines will soon be oil-burners. The cheapness depends partly on the relatively greater economy in handling and partly on the greater heating value as compared to cost. Seven barrels of oil will weigh about a ton. At a cost of $1.25 per barrel this would be equivalent to $8.90 per ton; at $1.50 per barrel, $10.50 per ton. But the heating value of oil, weight for weight, is greater than that of coal. From a number of experiments we have made in our laboratory, we find the heat value of California oil to be between ten and eleven thousand calories, averaging about ten thousand five hundred. The best coals of this coast average seven to eight thousand calories, and the usual steam coals much less. Comparing the cost of coal and oil as to the theoretical heat value, a ton of oil would be worth six to eight and the coal eight to nine dollars. The actual difference is very much greater than this, as there is much less waste in oil heating. From many actual experiments made under boilers, it has been found that the actual saving is from 25% to 40%. So that coal cannot compete with petroleum at the present prices, nor can it until its cost is reduced to between four and five dollars a ton, whereas it is now between seven and eight dollars a ton. This brings the cost of fuel on this coast to a par with the cost in the East, with its consequent great advantages.

Crude petroleum is used to a very slight extent otherwise than as a fuel, as a mixture for insecticides, and for coarse lubricating. A quantity is also used for gas-making, but it is then no longer petroleum. For all other purposes it must be refined, and this is usually effected by distillation. Crude petroleum is made up of a very large number of products of different boiling points, some

gaseous, some liquid, and some solid. On boiling the oil and condensing the vapors, first the gaseous, then the liquid, and then the solid pass over, a non-volatile residue being left in the still. These distillates and the residue are not simple bodies, but are themselves made up of a number of different bodies, that may to a certain extent be separated by more or less complicated methods. As a rule, no attempt is made to prepare these bodies in a state of chemical purity, but commercial products, fitted for particular purposes, are made, and they are usually mixtures of a large number of bodies. Of these commercial products the most valuable is illuminating oil, known also as kerosene, coal oil, burning naphtha, and by many other names. This is the part which in American oils has a specific gravity of about 0.800–0.840 and a boiling point of about 150° to 250° C. The Russian burning oils have a higher gravity and a lower boiling point. The essentials of a good illuminating coal oil are simplicity and homogeneity of composition and small carbon contents, low specific gravity, low viscosity, and high boiling point. An oil of high carbon contents and complex structure will give a smoky flame and disagreeable odor. If the gravity and viscosity are high, then it will not flow readily through the wick. If it contains low boiling constituents even to a small extent, it is liable to give off inflammable and explosive vapors when the oil is only slightly heated. Pennsylvania petroleum yields a large quantity of distillate that possesses these desirable qualities to a great degree, while from Russian and California oils only a small amount of such distillate can be obtained, and even this small amount possesses certain defects. Hence the greater value of the Pennsylvania oils. Of course it is possible to construct lamps to burn this inferior oil satisfactorily, and it may also be possible to devise a chemical method for improving the oil, but as yet it has not been done. The great mass of California distillates is used to mix with Pennsylvania oil and give a cheaper grade. Of course, from any crude oil, by repeated

distillation and treatment, some desirable burning oil can be made, but a large percentage is what is profitable. Various instruments and tests have been devised for testing the quality of an illuminating oil to determine its safety and value. All the European countries and many of our states have passed laws defining the requirements and regulating the sale of oil, but as yet California has no such law. An attempt to enact one at the last session of the Legislature met with failure.

The portions of the distillate boiling at lower temperatures than the illuminating oils are also of considerable commercial value. They are known as gasolenes, rhigolenes, ligroines, benzenes, petroleum spirits, and by many other names. They are used principally for solvents of fats, oils, varnishes, paints, etc., for gas engines, gas machines, ice-making machines, and for a great number of other purposes. The higher boiling portions of the distillate are employed chiefly as lubricants, and any desired quality can be made. Still higher boiling portions that condense to solids or semi-solids are of considerable commercial value. Such are the vaselines and paraffines. Here, again, Pennsylvania oils are superior, yielding larger amounts and usually a better quality of the products. On the other hand, California petroleums are superior to Pennsylvania oils, inasmuch as they contain asphaltum, sometimes to a very large extent. This is left in the retort after distilling off the other constituents. It is of great purity, being free from the sand and earthy matter that make up such a large part of natural asphaltums. These latter often contain 50% or more of impurities, which means a great deal when we consider freights.

Simple distillation is not sufficient to prepare the above substances so that they can be satisfactorily used. They must be subjected to a more or less complicated process of purification. This usually consists in distilling, washing with acid (usually sulphuric), alkali (usually soda or ammonia), and water. Sometimes these distillates are sprayed

through air to remove disagreeable-smelling constituents. Some of the oils are bleached, either by the sun or by chemical reagents. Sometimes they are filtered through charcoal or boneblack. In the case of solids recrystallization is usually resorted to, that is, the body, such as paraffine, is dissolved in some of the low boiling constituents, usually naphtha, and the solution cooled in ice and salt. The paraffine crystallizes out. These crystals are put in bags and the excess of solvent squeezed out, and the process repeated until the product is sufficiently pure. The white solid substance obtained from Russian petroleum is known as alboline, and is not identical chemically with paraffine.

The process of refining is mechanically quite simple. The oil is distilled from large iron or steel vessels, shaped like steam boilers, holding usually about twelve hundred barrels. Steam heat is sometimes used at first, or they may be heated directly with a burner. The gases that are at first given off or that result from the decomposition of the oil by high temperatures, are often utilized to heat the stills. The vapors are condensed by passing through long iron tubes immersed in cold water. If it is desired to save the very lowest boiling fractions, they must be condensed with ice and salt. The remainder of the oil is then distilled into three fractions:

First having a gravity of 65° to 58° B.
Second having a gravity of 58° to 38°.
Third having a gravity of 38° to 25°.

The first fraction is distilled into gasolene and A.B.C. naphtha. The second is distilled into various grades of kerosene and washed and purified as heretofore indicated. The third, known as paraffine oil, is cooled and the paraffine separated out. This is recrystallized several times as already explained. The percentage of these various constituents varies according to locality, and particularly is this so in California. Eastern oils contain from 10 to 30% of light oils, 50 to 75% of kerosene, and 1 to 35% of heavy oils containing paraffine. Russian oils contain 1–50% of

light oils, 10–40% of kerosene, 40–85% of heavy oils containing paraffine. California oils contain 1–30% of light oils, 5–50% of kerosene, 10–40% of heavy oils, 1–40% of asphaltum. To a considerable extent the proportions can be varied by varying the time and temperature of distillations, whereby the constituents are more or less decomposed. This operation is technically known as cracking, and to prevent this the distillation is sometimes conducted in a vacuum, whereby high temperatures are avoided. This mechanical and chemical treatment of course adds greatly to the cost of the oil. If we add packing, freight, and profits of distillers and middlemen, the consumer may have to pay as much as twenty cents a gallon for a refined oil, when the crude oil at the well is sold for less than two cents a gallon. But even twenty cents a gallon is a great reduction from the price in 1840, when it sold for from ten to twelve dollars a gallon. In California until comparatively recently, there were only three refineries—one at Newhall, belonging to the California Star Oil Co.; one at Alameda Point, belonging to the Pacific Coast Oil Co.; and one at Oleum, in Contra Costa County, belonging to the Union Oil Co., which one was founded at Santa Paula, in Ventura County. Now there are ten, and the number will soon be increased. One of the greatest dangers in an oil refinery is fire, and many disastrous losses have occurred in the burning of various works. But it is extraordinary, considering the inflammable nature of the product, that comparatively there are so few conflagrations.

Petroleum, chemically considered, is a liquid of varying, usually very complex, composition. The color varies from clear water white, through various shades of yellow, amber, red, and brown, to black. Its viscosity varies from great mobility to a thick tarlike mass. The specific gravity likewise varies, the extremes being from 0.771 to 1.020. The refractive index and coefficient of expansion are high; the specific heat is low; but, as in the case of color and specific gravity, there is great variation in the oils from different

places. Usually oils from the same locality resemble one another, but not always. In California especially the variation may be very great in oils from contiguous territories.

This great variation in physical properties is, of course, dependent on differences in chemical composition. Petroleums from different regions are totally different in their structure. The Pennsylvania oils are the simplest, Russian and California oils much more complex. But the simplicity is only relative. From Pennsylvania oils scores of substances may be obtained, and many of them are prepared on a commercial scale. The essential difference between Pennsylvania and Russian and California oils is that the former, viz., Pennsylvania, are made up mainly of what are known as methane derivatives or paraffines, while Russian and California oils contain relatively small amounts of these, the largest proportions being unsaturated bodies, olefines, benzenes, and naphtenes. The proportions of nitrogen and sulphur are also large in California oils.

Comparatively little has been done in a scientific way on petroleums, and particularly is this true in the case of California oils. It offers a wide field for investigation, especially as it is no doubt true that many valuable chemical products other than fuel and light-producing bodies are contained in the oil or may be made therefrom. From one point of view, combustion is a most wasteful action. The chemist's instinct is to conserve the products that come under his hands and to convert them into others that are of greater worth. In petroleum he has a most valuable raw material. There is little doubt but that in the future a large proportion, if not all, of the natural oil will be converted into products useful to man, and not annihilated in boiler furnaces. Mechanical, light, and heat energy should be derived directly from water and sun power, and leave the stored up materials—stored up probably at a cost of centuries upon centuries of time—to be used for material purposes. Relatively there is not much of these products,

and, once destroyed, they will not be regenerated for ages. We are wasting our heritage.

There is one question we have not touched on, and that is the origin of petroleum. How were these immense subterranean deposits of oil stored up? Where did they come from? Were they formed *in situ*, or were they derived from other strata? These questions have been discussed for a very long time. Redwood gives a brief history of the subject in his work on petroleum, from which some of the following facts are collected. Bacon indulges in some vague speculations regarding the origin of bitumen, and says it is formed from a mixture of a fiery and a watery substance, and that the flame attracts the naphtha of Babylon afar off. Bergmann, the Swedish chemist, says that petroleum is water combined by means of acid with the principle of inflammability. Macquer, a French scientist of the eighteenth century, regards petroleum as being formed from bitumen, which he thought was derived from the resinous and oily parts of trees, modified by long burying in the earth. Hatchett in 1798 wrote an extended treatise on mineral oil, and classified the various forms of petroleum, bitumen, asphaltum, mineral tars, and naphthas. He believed that all these bodies were derived from the resinous principle of wood. Several other chemists of the eighteenth century examined specimens of crude petroleum and expressed opinions as to its relations with other bodies. In 1817 Vanquelin, the celebrated French chemist, made a report on Italian petroleum, which was then used to light street lamps in some Italian cities. Nothing further seems to have been published until 1833, when Professor Silliman, Sr., described the petroleum of Pennsylvania. In 1855 Professor Silliman, Jr., wrote an extended account of these same oils. Since the excitement of 1860 many investigations into the nature of petroleum have been undertaken, and the literature of the subject is very extensive.

The modern theories in regard to the origin of petroleum may be divided into two classes, inorganic and organic.

This latter may be divided into two classes, derivation from plants and derivation from animals. The originator of the first theory, viz., derivation from inorganic sources, was Berthelot, the most brilliant and famous chemist of France. He showed experimentally that water, containing carbonic acid, or earthy carbonates, brought in contact with alkali metals at high temperatures, was decomposed, and so-called acetytides were formed. These, again reacting with water, evolved hydrocarbons that were contained in petroleum. The discoveries of his colleague and compatriot, Moissan, of the carbides, strengthened the theory. Moissan prepared in his electric furnace combinations of metals and carbon, the so-called carbides, that in contact with water would evolve all the various hydrocarbons that are present in petroleum. Berthelot believes that these reactions are going on in the interior of the earth, a molten interior made up of metals. Carbonic acid comes in contact with these metals, is decomposed, and is converted into carbides; these in turn react with water, producing petroleum, that is distilled and lodged in porous strata of the earth. Many chemists and geologists support this or a slightly modified view, among them Maquemie, Byasson, Cloez, Ross, Sokoloff, Coquand, Graburske, Hitchcock, and Mendeljoif. We have not time to enter into the various arguments advanced by those scientists in support of their view and can only say that it explains many of the observed facts, but not all.

The supporters of the organic origin of petroleum are very numerous. Some believe that petroleum is formed by intense heating of deeply buried vegetable matter analogous to coal, or lignite, and a subsequent distillation into superincumbent strata. Others, that it is due to a slow decay of minute vegetable forms in limestones at a very moderate heat. Others, that it is the result of decay under water, of vegetable matter, analogous to the action now going on in marshes. Others, that shales or limestones containing animal remains, have been subjected to heat,

and the petroleum distilled off, to condense in other strata. Others maintain that it is the remains of large sea animals that have accumulated for ages, become covered with deposits and afterwards heated, whereby petroleum is distilled off. All these theories have certain observed facts to support them and many have been strengthened by experimental evidence. For example, Engler, a German chemist, distilled about a thousand pounds of fish oil in a closed retort, under a pressure of four to ten atmospheres, and obtained about sixty pounds of a distillate which contained many of the natural constituents of natural petroleum and could be fracturated into a kerosene that could not be distinguished from the genuine product. Many other similar experiments have been made, but usually not with such satisfactory results.

The weight of evidence seems to be in favor of an organic origin for the petroleums and that the different petroleums are formed under different conditions and from different sources. Oils occur in formations of all ages, from Silurian to Miocene. As a rule the oil from the oldest rocks is simplest in composition, while those from newer formations are more complex and contain nitrogen and sulphur, the characteristic elements of animals. In other words, in early geological times when plant life alone existed, the organic matter accumulated in plant forms and was decomposed and petroleum of the Pennsylvania type resulted. In later periods, when animal life made its appearance, similar decomposition went on and a petroleum was formed, but of different composition. This is apparently the case in California. These plant and animal organisms were minute and probably lived in water. The accumulations of their bodies on the bottom of the seas became covered with clays and sands and were buried for ages, and it is from these organisms that the petroleum resulted. The oils in many cases were subjected to secondary distillation, and gases, light oils, and heavy residiums resulted. The question is one of the greatest interest, but we have not the time to develop it

fully; but I believe that in California we have a most promising field for determining the origin of its petroleum. We have made some experiments on this line in our laboratory. We distilled some California shale that contained not a trace of petroleum and obtained about twenty-five per cent. of an oil that appears to resemble petroleum. The shale was filled with the remains of small shell fish, and it is from these that the oil was formed. We shall continue these experiments and hope to obtain some conclusive results.

The question is often asked, Is the oil industry of California a legitimate business, with good future prospects, or is it a sporadic affair that after a few years will die out and leave nothing but decaying derricks and abandoned wells? No one can predict the future with absolute certainty, but there seems to be no doubt but that for several years at least a large supply of oil will be obtained. Until the Kern county fields were discovered, the outlook was not very promising. True, there was considerable oil produced, but the fields were limited in area and the sands not very thick. The product of Los Angeles county, after eight years flow, began to decline, and it was but a question of time when the wells would be exhausted. But the San Joaquin valley seems to be an enormous reservoir of oil, and future prospecting will no doubt show equally large deposits as have been found in the neighborhood of Kern river. The Sacramento valley has been but little exploited. The flow of gas in some counties suggests that oil may not be far off. There will almost certainly be a supply for many years. In the East, wells have been practically pumped for twenty and thirty years. It is merely a question of the size of the reservoir. If the oil sands are thick enough and the wells are not too close together, there is no reason why California wells should not be profitable for many years, as they are in the East.

The other essential of business success, viz., Will there be a demand for all the oil that can be produced? can also be answered in the affirmative. If used for no other pur-

pose than fuel, there will be demands far in excess of the present supply, if it can be demonstrated that the supply will be constant. The amount of coal consumed in California alone is more than one and three quarters million tons, equivalent to nearly eleven million barrels of oil, and we have the whole West for a market, for oil can easily replace coal, other things being equal. And the oil can be produced cheaply. Practically the only cost is that of the land and the digging of the well. Pumping costs but little, one or two cents a barrel. Of course transportation is now a considerable item, but this will be remedied. There is practically no doubt but that the oil industry will be a flourishing one for several years. All is not gold that glitters, and not all of the companies that have been organized will pay three per cent. a month. Nor will there be many individuals who will make a million in a year. But in the aggregate the oil industry means much to California. It has added to its wealth, it has enabled the manufacturer to get his power more conveniently and cheaper, it has added to the comfort of the people, and it has stimulated enterprise and attracted capital. The great question is, Will it develop and will it last? It is probably safe to say that it will do both.

THE ECONOMICS OF DEMOCRACY.*

By Frank W. Aitken.

ὄνθρωπος φύσει πολιτικὸν ζῶον—

—"One of the truths in which we go on perceiving more significance the more our knowledge increases."—Sir Frederick Pollock.†

The five questions propounded by Dr. Stallard in this competition practically amount to one: "What economic measures should a government adopt to secure its citizens equality in life, liberty, and the pursuit of happiness?" We immediately ask: "Why should a government adopt any means for this purpose? Is it within its functions to do so, or is it not a violation of individual liberty? And even if such action is permissible, is it at all certain that equality in these respects is desirable?" To these preliminary questions, which must be answered before the consideration of the specific means is taken up, the Declaration of Independence suggests an answer. It is that governments are in fact instituted for the very purpose of securing these rights equally to all. We are to examine the sufficiency of this answer as a justification of governmental activity for the purposes suggested. We shall try to show that it does indeed furnish such a justification, though not in the sense in which the assertions in the Declaration are usually understood.

We might well consider the preliminary questions from

* Stallard prize essay. October 1, 1900.

† Fortnightly Review, August, 1882; p. 219.

the point of view here presented, first discussing the functions of government and the rights of the individual, to see in how far governments should interfere at all in economic affairs, and then taking up the doctrine of equality to see in how far government action should be directed to that end. This would best express the logical connection of the parts of the subject. But because of the progressive nature of the particular statements in the Declaration of Independence here to be considered, it will probably be more convenient to discuss the various topics practically in the order in which they there occur; that is, as they are arranged in the five questions presented.

1.— *What meaning should be attached to the term "rights of man"? If the phrase is metaphorical, what should be its literal statement?*

The Declaration of Independence states that "all men" are endowed with "certain rights," and our first question is concerned with this statement. What, then, is meant by a right?

Great controversy has raged concerning this subject. On the one side it has been contended that rights are something inherent in men, and inseparable from them; that by the mere fact of his existence a man has an absolute "right" to his life, his liberty, and the pursuit of happiness. His rights, therefore, are said to be independent of his membership in any community, and prior to any claims of the state.

On the other hand it is argued that all right originates in the state, and that no one has any rights as against the state. The contradiction is complete.

The first thing which we notice about rights is that they are in no sense absolute, as a matter of fact. The right to life may be a "natural right," but nevertheless people die from natural causes without our thinking it a "natural wrong." Society, too, punishes wrong-doers by imprisonment—a clear violation of the right to liberty, if that be absolute,—and by death—a similar violation of the right to

life, if that be absolute. Rights are held conditionally; we know that under certain circumstances the state may disregard them, we being said to have "forfeited" them.

Of what avail, indeed, are our rights if others may declare them forfeited? It has been said, in derision, that natural rights are not rights at all, but merely natural desires. Here, however, is the real strength of the idea of rights. It is precisely because people universally desire life, liberty, and freedom to pursue happiness, for themselves, that they sympathize in and recognize others' claims to them; and this is what makes them rights. Professor T. H. Holland says right is "the name given to the advantage a man has when he is so circumstanced that a general feeling of approval, or at least of acquiescence, results when he does or abstains from doing certain acts."*

A right, then, is a recognized claim; and a natural right is such a recognition based on and necessitated by the very nature of man. "Clearly," says Herbert Spencer, "the conception of natural rights originates in the truth that if life is justifiable there must be a justification for the performance of acts essential to its preservation; and, therefore, a justification for those liberties and claims which make such acts possible."†

Being essentially a recognition, rights are social in nature: there must be others to recognize them, and so there never could have been any rights before the formation of a "social compact." Since they are based on the nature of man, and require the recognition of others, rights are not the mere casual and unregulated claims of actual individuals, existing independently of others and of the state. At the same time they are individual in their nature, and not merely the arbitrary creation of the state alone, to be granted or withheld at its pleasure. As Spencer says, it is absurd to think of a people creating rights, which it had not before, by the process of creating a government in

* Jurisprudence, Ch. VII.

† The Man vs. The State, Herbert Spencer; p. 95.

order to create them; or to treat an individual as having a share in rights *qua* member of the people while in his private capacity he has none. "If it is a plain fact," says Professor Bosanquet in his recent volume on the "Philosophical Theory of the State," "that 'a right' can only be recognized by a society, it is no less plain that it can only be real in an individual. If individual claims, apart from social adjustment, are arbitrary, yet social recognitions, apart from individual qualities and relations, are meaningless."*

Such is the meaning of this simple phrase. It is indeed metaphorical, and its literal statement would be,—claims, founded on individual relationships, which the members of society are bound by their own nature to recognize.

2.—*Are all men created equal with respect to the rights asserted by the Declaration of Independence to be inalienable?*

Bearing in mind the meaning already given to the word rights, we see that this question asks, in substance, "Is society bound, in consistency, to give equal recognition to the claims of all men to life, liberty, and the pursuit of happiness?"

What meaning, then, is to be attached to the word "equal," used in this connection? There is of course no question that men are not created equal, physically or mentally, and no one would say that the authors of the Declaration meant that they were. They did not even mean that all men were equal in their rights to political activity; for not one-half of the adult male citizens of the country were entitled to vote when, a few years later, our Constitution was adopted. It has been pointed out time and time again that the only equality they cared about was equality in civil rights—equality of treatment before the law. The doctrines of the necessity of consent to government, of the right to overthrow oppressive governments, and of resistance to arbitrary treatment, as embodied in the Declaration of Independence, and in the Magna Charta long before, arose from opposition to hereditary privilege,—

* The Philosophical Theory of the State, Bernard Bosanquet; p. 71.

to any fixed status from which no escape was possible. These doctrines were based on a feeling of individual worth; we may see both the justification and the limits of equality, by an analysis of the idea of individuality.

Professor Seth quotes Sir Henry Maine's well-known statements that "the movement of the progressive societies has hitherto been the movement from Status to Contract"* and that "the individual has been steadily substituted for the family, as the unit of which the civil laws take account,"* and says: "The fundamental law of moral progress, whether in the race or in the individual, may be stated in essentially the same form. . . Progress is, in sum and substance, the progressive discovery of the individual."† This principle is borne out by history. In early and undeveloped tribes, the individual is unnoticed; he is merely a part of a solid, compact whole. In the Grecian and Roman states there was some recognition of persons as persons, in whom certain rights were recognized, but the individual was merged in the family—family estates were inalienable in Greece, and the "son of the family" was almost a slave in Rome. So in regard to the state. A few days ago robbers forced a county treasurer, at the point of a pistol, to open the vault in which the county funds were kept; no such thing could ever have happened in Greece or Rome, where every robber knew instinctively that a public officer would readily lay down his life for the sake of the state. The individual was always subordinate. Christianity, however, taught that all men were sons of God, and of immortal worth, and consequently brothers in origin and in destiny; the implication that all men were equal in the sight of God brought a gradual increase in the recognition of individual worth in actual life. The Protestant Reformation further strengthened this recognition through its express assertion of the supreme value of the individual conscience.

* Ancient Law, Sir Henry Maine; pp. 165, 163, 3d Am. Ed.

† Ethical Principles, James Seth; 323.

Such are the influences leading to the doctrines enunciated in France in 1762 by Rousseau and in America in 1776 by the Declaration of Independence.

The belief in equality, then, is based on the feeling of individual worth, and amounts to this—all men are to be treated as individuals; each is to be considered in and for himself alone, and treated as he himself deserves. In short, each is to make of himself as much as he can, and not suffer from any fault not his own. This is the only inalienable right; it is so because by his own nature man must claim it for himself and recognize it in others.

There is another side to this progress spoken of by Professor Seth. Along with the progressive discovery of the individual has gone the progressive development of the individual. It is because the members of an advanced society are in fact persons of individual worth that they recognize the demands of similar persons about them. "Savagery is uniformity," says Professor Harris; a savage tribe, he points out, is merely a horde of men, women, and children, who think alike, act alike, and do the same work. "The rudimentary societies are characterized by the likeness of equality; the developed societies are characterized by the unlikeness of inequality or variety."* The French sociologist Le Bon sees anatomical evidence of this in the varying capacities of human skulls. "It is found," he says, "that the races in which the volume of the skull presents the greatest individual variations are the most highly civilized races. In proportion as a race grows more civilized, the skulls of the individuals become more and more differentiated."† We shall see later that this differentiation of individuals is an essential condition of human progress; at present it is sufficient to note that it is because the members of advanced societies are themselves persons of individual worth that they recognize the individuality of others, and that it is only because they are persons of

*Inequality and Progress, George Harris; p. 75.

†The Psychology of Peoples, Gustave Le Bon; p. 48.

individual worth that they can claim such recognition for themselves.

A man's right to life, liberty, and the pursuit of happiness, then, is founded upon his individuality and is conditioned by the use he makes of it. In concrete circumstances men are usually regarded as having unequal rights, as in the case of an inferior and a superior race in the same territory. Such a superior race stands for better conditions—for more individuality—and on this basis has a "higher right." No judge, of course, is present, to decide as to this higher right, but the right exists, in the certainty of recognition by the public opinion of the times to come. It is to be noted that no race is absolutely superior to another—superior in all respects. Each race, like each individual, is regarded for itself alone, in accordance with the circumstances of the particular case, and this is the real equality. The English subdue other races just as they themselves would give way before a higher civilization; the savage defers to Englishmen just as some Englishmen defer to others and all defer to the law. In every case the lower principle yields before the higher one, and this is equality—like treatment under like circumstances. All men are equal in having a right to be treated as they deserve; but it by no means follows that all men deserve to be treated alike. That some men and some races are inferior to others in ability, in potentiality, in significance, is an undeniable fact; what is required is not that each shall be allowed to make of himself as much as every one else, and no more, but that each shall be allowed to make of himself as much as he can.

All men, then, are equally entitled to life, liberty, and the pursuit of happiness; there should be no hereditary or other fixed restrictions or privileges. In each case the right is conditioned upon one's proper use of his individuality—the criminal suffers because of his improper use of his,—and on the necessity of conforming to higher principles—as in the case of inferior races and of various kinds of "state interference."

3.— *What are the economic conditions upon which the enjoyment of these inalienable rights depends?*

We have seen that the inalienable rights amount to one's being allowed to make as much of his life as he can. Economically, this involves, not equality of possession, but equivalence, in each case, of merit and reward. If each is to reach an importance equal to his deserts, however, there must be perfect economic mobility. One hindrance to this has always been, of course, the hereditary transmission of privilege; this is contrary to the idea of individuality. But, plainly, equality in the sense that each is to be regarded for himself alone—that there shall be no hereditary privilege—does not exclude hereditary inequality, as, for instance, of ability; and the essence of the idea is that inequality of importance is to be determined by inequality of ability alone. One exception to this is in the case of hereditary transmission of property. Inherited wealth gives an advantage, of course; but it is allowed because the possession of property is involved in the family relation, and the principle of the family is higher than the mere abstract principle of equality. But while a father can give his children wealth he cannot properly give them privilege, which is not so intimately bound up with the family and need not be exempted from the general rule.

The idea of individuality, then, on which the right of equality is based, requires economic mobility in the sense of the absence of any inertia or friction retarding change from one economic condition to another. There must be freedom for merit to find its proper place—for incompetence to lose its wealth and ability to overcome its poverty, without being hampered by artificial distinctions. But economic freedom, as usually understood,—that is, freedom of competition—is not sufficient to produce this sort of mobility. Men may be perfectly free from outside interference as regards their buying and selling, and still have no chance to assume their proper places. The advantage in a bargain between a rich man and a poor one is always on the

side of capital. "The ownership of capital," says Professor Giddings, "is the best known lubricator of social friction, and when skilfully used, an energetic coercive force."* Again, poverty is cumulative. It makes increasingly difficult the acquisition of the skill and knowledge that are necessary to advancement.

Freedom of competition essentially fails to apportion reward according to desert. Abstractly considered, it may be true that (except for the economic friction already considered) the rewards of industry vary according to the value of the work done—that the man who does work ten times as important as another receives ten times as much in return. But it is seldom noticed that his reward is worth much more than ten times as much to him as the other is to the one who receives it. It is wholly a question of surplus, so far as bettering one's economic condition is concerned. It has been pointed out by a German economist† that as income increases the amount spent for the necessaries of life, while increasing in absolute amount, becomes a smaller proportion of the whole; the rich man has a disproportionate share of his income left over to use in bettering his condition. "To him that hath it shall be given." This prevents a proper economic mobility; if all a man's time and energy are absorbed in merely keeping alive, it can hardly be said that he is free to take his proper place in the economic hierarchy. The great disproportion in surplus rewards makes poverty practically a status, and as such inconsistent with the principle of equality.

The economic condition, then, required for a proper enjoyment of the rights of life, liberty, and the pursuit of happiness is perfect mobility, by which is implied, among other things, the absence of anything in the nature of a status or permanent disability.

4.—*Is it the function of governments to secure these economic conditions equally for all men?*

* Democracy and Empire, F. H. Giddings; p. 105.

† Dr. Engel. See Economics, A. T. Hadley; § 359.

The functions of government are intimately bound up with its origin; and here we meet with directly contradictory theories. On one side it is argued, by those who hold to the idea of abstract right, that governments exist for certain narrowly defined purposes and cannot properly exceed them. Thus they limit the functions of government very strictly, in the interest of "individual liberty" and "private right," the extreme individualists denying the right of the state to do anything except enforce contracts and keep the peace. It is hard to see why they should make these exceptions, or how they can justify them. The enforcement of a contract, for instance, is an "interference" with "individual liberty," and can only be justified by reference to other principles, which are equally applicable to various other kinds of state action. If the state can enforce contracts because by so doing it furthers public interests, why can it not establish schools for the same reason? The unfailing answer of individualists to such questions as the last is, "Because it is not one of the purposes for which the state exists." It used to be thought that states and societies had originated in a compact entered into by their various members; but while this view would account for the narrow limiting of purposes "for which the state was formed," it would not show that none had since been added by common consent—by later contracts, if you please. But it is now recognized that the social compact is utterly imaginary. The historians and anthropologists tell us that their researches give no indication of a non-social condition; the publicists say that rights could never have existed except in society; the philosophers declare that the formation of a state by non-social beings is a logical absurdity; and the sociologists deny that man could ever have lived except in society.

The opposite theory, which derives all rights from governments and grants them unlimited powers, is equally unfounded. As we saw in dealing with this subject of rights before, it is absurd to think of a government granting

its citizens rights which they had not (even in the form of claims as yet unrecognized) before, or possessing, itself, any rights at all independent of the people in and through whom it exists.

In truth society and the state are natural growths; they are not entered into consciously, on the one hand, nor are they forced upon individuals willy-nilly, on the other. Sir Frederick Pollock has said that no saying in Greek literature is so well worn as Aristotle's dictum that man is "a political animal," and that no saying has worn so well.* The Greek contains much more than we imply by the mere words "political animal." In accordance with Aristotle's idea that the "real nature" (φύσις) of a thing was "what it was when completely developed," φύσει πολιτικὸν ζῶον means "a creature reaching his true development in the life of the citizen" (πόλις, city). There we have a complete theory implied; that the state exists because in it alone man can develop properly. Professor Bosanquet expresses the idea well. "In it," he says, "or by its help, we find at once discipline and expansion, the transfiguration of partial impulses, and something to do and care for, such as the nature of a human self demands. If, that is to say, you start with a human being as he is in fact, and try to devise what will furnish him with an outlet and a stable purpose capable of doing justice to his capacities—a satisfying object of life—you will be driven on by the necessity of the facts at least as far as the state."† To put it shortly, society results from the very nature of man. Society, rather than the state, is here referred to by Bosanquet. As the terms will be used here, by a "state" will be meant a society politically organized; by a "government" that portion of the state to which political power is temporarily delegated for the purpose of carrying on its functions.

The position here taken is that society exists because of the very nature of man. Human beings are not

* Fortnightly Review; August, 1882.

† Philos. Theory of the State, p. 150.

mere isolated and unrelated atoms independent of and unconcerned with each other: they are social in their nature and must inevitably live their lives in company with and in dependence upon each other, if they are to obtain any fullness or completeness of living from them at all. The hermit's life, if indeed it be possible, is inexpressibly thin and empty. And as a matter of fact men do habitually live in groups; they have always recognized that life is better when so lived.

Societies are of various kinds. Savages associate in tribes held together by military and economic and usually by family bonds; civilized men, besides their various "political societies"—*i. e.*, those on which states are based—organize themselves into any number of minor "societies" for particular purposes, *e. g.* churches, "social clubs," card clubs, art associations, cycle clubs, charity societies, etc., each characterized, in the words of Professor Giddings, by the likemindedness of its members with respect to the object or purpose for which it exists. The same characteristic, we find, underlies a "political society," which is included under Professor Giddings' definition of a society as "Any number of likeminded individuals, who know and enjoy their likemindedness, and are therefore able to work together for common ends."*

The basis of society, in the sense in which we have been considering it, is that its members are alike in recognizing that they can live better together than they can alone. Consequently, a society is justified in doing whatever results in a better life for its members. Actions that are for "the public good" are justified, and those that are not for the public good are not justified, because the state itself originates in concern for the good of its members.

The state and government are essentially devices for using the full power of the society to attain its ends. Though society is a natural and unconscious growth, governments may properly be regarded as "instituted," as

* Democracy and Empire, p. 51.

the Declaration of Independence says; and whether instituted or not, they may properly be thought of as existing "to secure" "inalienable rights." That is, the purpose of government is to bring into operation the whole force of the society when a right which society recognizes is denied by some individual. "The whole purpose of a law," says Professor Holland in his "Jurisprudence," "is to announce in what cases that objective support" (*i. e.*, the support of the physical force of the society) "will be granted, and the manner in which it may be obtained. In other words, law exists . . . for the definition and protection of rights."* Government exists for the same purpose. And whenever a society may legitimately act in a certain way, it may properly proceed by means of state action (government action), since the government is the only means at the command of society for using its whole force effectively. Government being the only means by which the whole society, as organized in the state, performs its functions, whatever may be properly done by a society may properly be done by the government. State action, then, is justified when it is for the real good of the society.

Of course there is never any objection to state action when the end in view consists of an obvious good to all alike. But when a public action benefits particularly one portion of the society and the cost is borne particularly by another portion, the justice of the proceeding is denied. But, since each person finds himself in a society because it can make his life better and since in each case it does actually make it better, he cannot complain if it uses its power for the purpose of making others' lives better, or even if, in so doing, it interferes somewhat with his individual caprice.

The objection to state action—"state interference," it is called—proceeds upon a totally erroneous assumption; there is no necessary antagonism between state action and individual liberty, as is usually supposed. The view which makes men mere abstract individuals to be jealously pre-

* Chap. VII.

served from aggression by others, and government a mere means of preventing such aggression, is essentially narrow and incomplete. According to this view abstract liberty, or freedom from outside restraint, is of the greatest importance, and any infringement upon it is necessarily evil. Government, however, is looked on as on the whole beneficial, and preservative of individual liberty. Now this is a manifest contradiction, if liberty is merely the abstract thing it is usually considered, for we cannot increase the total sum of liberty by decreasing the portion of each person. If a man does indeed derive benefit from being a member of a society, we cannot say that any action which is fundamental in a society is in itself otherwise than beneficial. And if the very nature of man requires him to be a member of a society in order to make the most of his life, that which is fundamentally involved in the action of a society cannot be in itself narrowing.

The abstract idea of liberty is fundamentally self-contradictory. Under it the state cannot be justified even as a mere association for the enforcement of contracts and the securing of internal order; for to deny one the right to break his contracts at will, and to conduct himself personally as he may see fit, are flagrant violations of "individual liberty," and can only be justified on ulterior considerations of "right," of "public good," or of "implied consent." Thus at the very start the only escape from anarchy is in the adoption of other principles. Further, government being granted as possible, for the sake of the argument, the principle cannot furnish any justification whatever for the coercion of a minority—even of one member—by a majority; such a proceeding is plainly a violation of "individual right," and has to be justified on another ground, namely, that the consent of the coerced members is implied in their previous conduct, or in the fact that the action is for the public good (which is only another way for saying consent is implied). In its practical application the doctrine has to fall back on the idea that certain things are implied in

man's nature. A crucial case is given by Bosanquet—a man's voluntary sale of his liberty. "A man may contract to become a slave, but no civilized government will enforce his contract at law, and the ultimate reason for the refusal is, as Mill in effect points out, that man's nature is to exercise will—to have liberty—and a resolution to divest himself of this capacity must be taken as *ipso facto* void, by contradicting the very essence of humanity."* So, no government will recognize a man's consent to be killed, and suicide is universally frowned upon, in spite of a man's individual liberty to do as he pleases with his own; and the reason can only be the one Bosanquet indicates—his inherent nature. Mill supplies another instance: a man who wishes to go out on an unsafe bridge is properly restrained because he cannot be supposed really to wish his own death.† That is to say, his abstract right to do as he pleases is subjected to the higher principles of his own nature.

But it is not man's nature to demand that he be "let alone;" men are not mere isolated individuals, or atoms. It is his nature to act with others; to rely on others; to help others—in short, to be social. The very existence of society attests this. And just as a man's real nature may be appealed to as a justification for interfering when he wishes to place himself in danger, or sell his liberty or his life, so may it be appealed to when social action is opposed; a man is himself only in a society, and so he cannot really be opposed to anything which is for the benefit of the society. Since man's real nature is to be social, it is absurd to think of men as mere unrelated individuals, to be left to themselves as much as possible; since a man obtains his real development only in a society it is essentially false to speak of state action as a limitation on individual liberty, or as necessarily contrary to his best interests.

It must not be thought that there are no limits to state-action; but these limits are not to be found in any notions

* Philos. Theory of State, p. 118. Liberty, J. S. Mill; Ch. v.

† Philos. Theory of State, p. 69.

of abstract liberty, but rather in the idea of society itself. Since the purpose of social and state action is the public good, no action is justified which is productive of great actual harm, even if this be to but one person; there must always be a reasonable relation between sacrifice and gain. No absolute limits can be assigned; we cannot say just how far respect for the individual is to go—even the punishment meted out to the criminal is in accordance with his own essential beliefs as a reasonable social being. But in general it may be said that nothing may be done against the individual's "real will" (taking this in the sense in which it is used by Mill in his illustration of the man and the bridge)—nothing which his essential ideas as a social being would not sanction. Otherwise that recognition which constitutes right will not be obtained. This, of course, leaves the extent of state functions rather vague; but definition in such things is always impossible—it is always necessary, in other cases as well as in this, to depend upon "*bona fides*," since we cannot lay down unchanging rules for a world of change.

But in one regard the functions of the state are quite limited. And properly the limitation grows out of its own nature—out of the necessity of advancing the "good life." The "good life" is individual as well as social; it involves individual characteristics and individual effort. Consequently society must not do anything to merge the individual in the mass, or weaken his own self-reliance. Whatever it does, through the state, for the aid of its weaker classes must be done indirectly—it must not weaken the recipients. State action, as Professor Bosanquet says, is justifiable only when it releases from some narrowing and restraining influence—when the instinct of a better life is struggling against some obstruction—and it is confined to the removal of such hindrances.*

To apply these principles more directly to the matter of economic conditions: we see that the state may properly

* Philos. Theory of State, p. 191.

act, indirectly, to relieve the condition of oppressed classes, in order to allow them to secure themselves a better life.

The causes of poverty are many and various. Professor Giddings has called attention to one of them, previously little noted. "There can be no social gain," he says, "that does not entail somewhere, on the whole community, or on a class, the break-up of long established relations, interests, and occupations, and the necessity of a more or less difficult readjustment. . . . The suffering that progress costs is borne for the most part vicariously. The classes who are displaced, whose interests and occupations are broken up by the relentless course of change, are not the ones who secure the joys of richer and ampler life. That which enormously benefits mankind is too often the irretrievable ruin of a few. . . . To some extent the numbers are recruited by victims of pure misfortune, whose undoing has been caused neither by their nature nor by their conduct."* So Professor Seth says it is for society to reckon up the costs of progress, and strive to maintain the equilibrium which progress seems continually to disturb.† In so far, then, as suffering is caused by the progress of society, the latter, through the state, is particularly justified in lessening it if it can.

Any suffering caused by poverty, however, may properly be relieved, whatever the cause of the poverty itself, provided it tends unduly to narrow the life of the citizens by the creation of permanent inequality of opportunity. Even on the ground of expediency this may be done, for poverty is cumulative in its effects, and no society thrives well if there is any class which is permanently far below the others.

The justification for state action on behalf of the lower classes becomes greater as society progresses. Complexity is characteristic of advanced civilizations; it involves intense specialization of function, sharp distinction of classes, and

* Democracy and Empire, p. 77.

† Ethical Principles, p. 306.

increasing divergence in economic condition. Complexity aids inequality of condition, and inequality of condition is cumulative. The extremes of economic condition always tend to become more widely separated, and the disadvantages of the lower levels to become greater and greater. Poverty is degrading—pauperizing: "the great enemy of the poor is their poverty." It is dangerous as well. "Poverty of itself does not make a pauper," says Hegel; "the pauper state implies a frame of mind, associated often with poverty, consisting in inner rebellion against the wealthy, against society, and against constituted authority."* For its own protection and its own progress society may attempt to prevent the formation of such a class. Social well-being demands complete internal mobility—a continual sifting—and requires that any condition of stagnation be done away with. We have seen that this is equality in the proper sense.

State assistance to the distressed classes is of the same nature as the enforcements of contracts. Protection against the merciless, to whom economic inertia gives undue power, in the first case, is similar to protection against the unscrupulous in the second. It is of the same nature, again, as allowing bequests of property; an abstract principle is put aside to admit of a higher principle being followed—in the one case, the principle of the family, and in the other, the principle of the state itself, namely, better life.

The state, then, may properly give relief to such of its members as stand in need of it. For its own protection and progress it may oppose the creation of a class of mere workers,—citizens in name only, so far as the real life of society is concerned,†—and it is acting consistently with its own purpose in any attempt to better the life of its members. But all such action must be in the nature of removing conditions which are operating to prevent the realization of a good life in its citizens.

* "The Philosophy of Rights," Hegel; Dyde's Translation, § 244.

† See Ethical Principles, p. 306.

5.— *What legislation is required to attain these ends?*

Here it is possible to lay down only the most general principles. We may consider in how far the state ought to proceed along the path which we have seen it may properly take; we may inquire what ideal must be kept in view and what limitations must be regarded. But any exact announcement of the solution of the problem that has baffled social investigators for ages must be presumptuous in the extreme. "Ignorance alone has confidence enough to attempt that which is possible only to omniscience."*

The proper aim of state action is not a bare equality, in the sense in which equality is usually understood. All that can be demanded in the name of equality, as we have seen, is that each shall be allowed to make as much of his life as he can—not that the state shall so arrange that each makes as much of himself as anyone else. The state may secure equality of opportunity; it cannot, and should not, secure equality of achievemement.

It cannot, since inequality in ability is one of the most fundamental facts of human nature. As Robert Louis Stevenson quaintly puts it, we think of individuals now, not as "springing into life from God knows where, incalculable, untrammeled, abstract, equal to one another, but issuing modestly from a race, with virtues and vices, fortitudes and frailties, ready made; the slaves of their inheritance of blood; eternally unequal."† No human measures can bring about a dead level of equality among men who are "slaves of their inheritance of blood, eternally unequal." No government can prevent economic and social differentiation as long as human nature remains as it is—as long as men are unequal in powers, and tend to defer to their superiors, and demand freedom of action for themselves and others. If men should lose this desire of liberty, strict compulsion might produce economic equality; but without a fundamental change in human nature equality of condition is impossible.

* Inequality and Progress; Preface.

† Essay on Gentlemen.

Nor should government strive for such equality of condition. The equality of men does not demand it; if each man is to be free to have the advantage of his own abilities, he must be willing to suffer the disadvantages of his own shortcomings; and to hold down the more able to the level of the less would be an intolerable violation of the principle. From the standpoint of the state, as well, such flat equality would be disastrous. "Inequality without liberty and fraternity is indeed an evil," says Professor Harris; "But essential equality would destroy personal freedom, and would leave as much fraternity as a man enjoys when he looks at himself in a mirror."* There can be no real social unity and no satisfactory life in a society of identical mediocres; there must be variety of situation and of function.

The welfare both of the individual and of society depends upon the presence of inequality. The individual must have full opportunity to make use of his own powers to better his condition; and society depends on inequality for progress. As we have seen, an advanced society is characterized by great diversity of function and condition; we may here notice that progress itself results from inequality, by means of continual sifting. Professor Giddings points out that social classes are always changing in membership.† Thus he says of those displaced by the readjustment consequent upon progress, that their personel is continually changing, but that "the class, as a class, is endlessly renewed."‡ Men are continually dropping back into this class, and others are rising out of it; and the same process goes on in all the other classes. New leaders are ever pressing forward. The rich men of the present are recruited from the poor of a generation ago; the fortunes of that time are small when compared with those now amassed. Social progress does not result from the onward

* Inequality and Progress, p. 153.

† In Principles of Sociology.

‡ Democracy and Empire, p. 81.

movement of those in the lead, but from the continual advance of new leaders—in industry, in politics, in thought, in wealth,—to positions beyond those formerly marking the extreme front. It is essentially dependent upon equality of opportunity and inequality of achievement, and is entirely inconsistent with flat equality of position.

The state, then, should not strive to reduce men to a dead level of equality; to do so is to narrow their lives and put an end to progress. Its true aim is to bring about a real freedom of opportunity. But, as we have seen, mere economic freedom—freedom of competition—does not secure this, because of the inherent disadvantages of the poor in bargaining, and the cumulative effect of poverty. The state may properly act, then, to remove these disadvantages, so as to secure this freedom; in doing so, it must not attempt to secure any flat equality of position and must not weaken any of its citizens by giving direct aid. How may these conditions be met?

Such measures as the abolition of trusts, of the gold standard, of money, or of indirect taxation, and the adoption of the single tax on land values are merely partial remedies, in so far as they have any merits at all. They do not go to the root of the matter, and do not alter the essential conditions of industry. Whatever schemes may be adopted, whatever relief may be given, there is certain to be constant economic readjustment if private direction of industry and freedom of competition are retained. And in this readjustment the inefficient will continually drop behind, because their work is not worth having except at low wages. Where liberty is retained, inequality of capacity leads straight to inequality of condition.

Socialism, recognizing this, proposes to secure equality at the cost of liberty by turning all industry over to the state and ensuring a livelihood to all. Its ideal is a state in which all are well provided for, while having but little to do, the hours of labor being short; but it is entirely inadequate to bring this about. If all the wealth of the civilized

world were to be divided equally among the people of the various countries, there would be a scarcely appreciable betterment of the condition of the lower classes. Le Bon says that such a division in France of all incomes of more than £1000 a year would give each workingman an increase of four and a half per cent.* We note, too, that even the enormous income of a Rockefeller would give but a dollar per year additional to each resident of the United States. It should be obvious that a state in which hours of labor for all are short, and the great incentive of self-interest is lacking, would not be in better material circumstances than one under the present system. Socialism assumes an increase of wealth, while in no way making provision for greater production, unless, indeed we consider the employment of the men at present unemployed to be such provision. But here socialism assumes that all men are equal in capacity, and forgets that the great reason for men being out of work is that their work is not worth having at normal prices. We may be sure that instead of the wealth of the community increasing under socialism, freedom from personal responsibility and certainty of employment would result in wastefulness, indolence, and general poverty. Socialist schemes differ greatly, but all have government regulation of industry as a basic principle. Consequently any system of socialism would destroy personal responsibility, self-reliance, and individuality. Each system, too, aims to produce equality of condition, which we have already seen to be impracticable and disastrous. It may be noted incidentally that even equality of condition will not produce equality of satisfaction, since men differ widely in their desires and tastes; consequently even at its best (or worst) socialism does not succeed in bringing universal happiness.† There is more justice in our present system and more real contentment, for the man of finer organization, who has more discriminating tastes and higher ideals, has also, as a

* The Psychology of Socialism, Gustave Le Bon; p. 307.

† See Democracy and Empire, p. 120.

general thing, a greater ability to secure the wherewithal for their satisfaction. Socialism, then, is inadequate to accomplish its ends; and these ends are in themselves highly undesirable, since, as we have seen, they are subversive of the best life and fatal to progress. It aims to produce an undesirable condition by impracticable means.

Where liberty is retained, inequality is inevitable; where equality is enforced, progress ceases. Such is the dilemma with which all schemes to produce equality of condition are confronted. The truth is, of course, that bare equality is not to be sought for and that absolute rules for social improvement are impossible. Great inequality is fatal to stability, but some inequality there must be, to allow of progress; a progressive society is in a state of moving equilibrium, and can never be reduced to any fixed condition without disaster. Conditions are always changing and legislation must change with them; no final solution of the problem is possible. We can only say that the equilibrium must be maintained between equality and liberty, in such a way as to prevent fixity and give the best chance to each to adjust his condition to his merit. Certain general methods may be adopted to compensate for the disproportionate inequality of reward which we have seen threatens to reduce poverty to a status.

The effect of competition may be lessened and the disadvantage of the poor in bargaining overcome, not by interference in individual bargains, but by a general lightening of the burden of the lower classes. The employe is to be aided, but not at the expense of the individual employer. In the first place, legislation against unfair bargaining may be found practicable and necessary—such things as "company store," for instance, may be prohibited, and general relief may be granted by the establishment of courts for the adjustment of disputes between employers and employees. In the second place, taxation may be adjusted to overcome somewhat the disadvantages of the poor. The more general exemption of small amounts of property from taxation (and

from attachment) would prevent the total loss of economic recuperative power; the progressive taxation of incomes would compensate in some measure for the disproportionate advantage of capital. Such assistance, although indirect and so not tending to weaken the individual as direct aid would, must nevertheless be given very carefully: indolence must not be promoted, nor the industrious deterred from activity. No limit can be definitely assigned; here as always, the circumstances must govern and there must be "*bona fides.*"

A more fundamental method of relief seeks to raise the standard of the lower classes. It recognizes that the surest way to secure more for the laborer is to make him worth more, and that any lightening of the burden of the poor only makes it possible for wages to be still further forced down. So it advocates the establishment of schools (especially of a technical nature), and libraries, to increase the workingman's ability, and the formation of trade and district clubs, coöperation, and local management in minor political matters, as a means of increasing his self-reliance and initiative, the lack of which has been the chief cause of his "degradation." Herein lies the function of trade-unions as a means for developing trade spirit, knowledge, and "*esprit du corps.*" It is in this, too, that coöperation offers great advantages; it makes the men in some degree employers, with the responsibilities and opportunities which employers have. The same is true of profit-sharing, when it is in some way combined with a sharing of the risk of loss.

These are offered as mere suggestions of the general methods which may be followed. No final solution can be outlined, since the relations of various classes are continually changing and legislation must accommodate itself accordingly. Whatever means are adopted, a society must always see that they are not carried to excess. Good faith and intelligence are necessary in the use of any but rule of thumb methods: and no rule of thumb is applicable to a living, growing thing such as a society.

Nor can any legislation alone, however wisely conceived and executed, bring complete social contentment. Laws are but empty forms unless the spirit of the society is in them and behind them. There will always be a "submerged" class, as long as there are "cheap men" who are content to be less than they might—to work cheaply and live cheaply, in preference to living well at the cost of working hard;* here again the trade-union has a great opportunity to improve the laborer's conditions by arousing a proper *esprit du corps*. Such men, and others, will always be ready to take advantage of legislative enactments unfairly. And since economic injustice results not from the provisions of the statutes, but from the existence of unscrupulous and merciless individuals ready to take advantage of the inevitable shortcomings of laws and of the laxness of the public in regard to their enforcement, it will continue as long as they remain. The ultimate remedy for the cheap man who drags others down with him, and for the unscrupulous man who pushes others under him, is not to be found in laws, but in the growth of a better social sense and a stronger feeling of fellowship. Only a full realization that society is a community which exists to improve life, and that men are bound together in it, can remedy social conditions.

We have seen, then, that the assertions in the Declaration of Independence are substantially true, if properly understood, although as ordinarily taken they are abstract and meaningless. Rights, we have found, are individual claims which others by their very nature are bound to recognize, and the only inalienable right is the right to be considered independently of accidental distinction, as for instance, of hereditary privilege. This is the only equality —equality of opportunity to show oneself unequal to others, and to obtain a position equal to one's ability. Thus perfect economic mobility is implied, and anything in the nature of a fixed status must be done away with. Govern-

* See Economics, A. T. Hadley, § 360.

ments, as the organization of social power, may properly direct efforts to this end, since it is involved in the purpose of society—a better life for its members—and is necessary for its own preservation and progress. But in so doing they must aid only indirectly, by removing whatever hindrances may have been present. Certain general methods of doing so have been suggested, and it has been seen that legislation must vary according to the conditions of each time, the effort being to maintain a constant moving equilibrium between the two factors of equality and inequality, between the two ideals of stability and progress; and that such legislation can only succeed when it is backed by a sound public opinion—a thorough sense of justice and fellowship. For economic and social equality depend upon facts of human nature far beyond the reach of legislation: it is only as man becomes more social that society can become more humane.

COMMENCEMENT WEEK.

Commencement week of 1900 opened with the Class Exercises on Thursday, May 9. After a concert on the lower campus the senior oak was dedicated, addresses being made by J. W. S. Butler and Paul Sinsheimer of the graduating class and Fred M. Allen of the class of 1902. The pilgrimage to the different buildings followed and brief addresses were made by the following speakers: South Hall, Professor LeConte and Ralph Talcott Fisher; North Hall, Muriel Eastman and Milton H. Schwartz; Philosophy Building, Alexander Gordenker; Mining Building, William Beaumont Schaw; Chemistry Building, Glenn L. Allen; Library, President Wheeler and Richard Walton Tully. In the afternoon the spectacular extravaganza "The Annual Pilgrimage to the Shrine of the Most Learned Dragon Faculty" was given in the Class Day amphitheatre. In the evening the Librarian and his staff received the graduating class in the Bacon Art and Library Building. The artistic and bibliographical treasures were on exhibition and brief addresses were made by members of the class and by the President of the Alumni Association.

On Friday evening the Commencement Ball was held in Hearst Hall.

Saturday evening the men of the graduating class banqueted in San Francisco.

On Sunday afternoon at four o'clock, in Hearst Hall, Professor Thomas Rutherford Bacon preached the baccalaureate sermon, taking as his text James 1:27.

On Monday morning meetings of the Graduate Council, the Academic Council, and the Academic Faculties were

held in the Philosophy Building for the purpose of recommending to the Regents for degrees those who had satisfactorily completed courses in the Academic departments. Two candidates for the degree of Ph.D. were recommended; eight for the degree of A.M.; three for the degree of M.L.; five for the degree of M.S.; forty-eight for the degree of A.B.; one hundred and twenty-one for the degree of B.L.; one for the degree of Ph.B.; and sixty-three for the degree of B.S. The Academic Faculties elected the following as Deans for the academic year 1901–02: College of Letters, Professor Lange; Social Sciences, Professor Stringham; Natural Sciences, Professor Slate; Commerce, Professor Page; Agriculture, Professor Hilgard; Mechanics, Professor Cory; Mining, Professor Christy; Civil Engineering, Professor Soulé; and Chemistry, Professor O'Neill.

Mrs. Hearst during the afternoon entertained the graduating class at a garden party at her country residence, Hacienda del Pozo de Verona. In the evening the Philosophical Union held its last meeting for the year. Dr. W. P. Montague read a paper on The Bearing of Evolution on the Immortality of the Soul, and Professor Howison summed up the year's work in a Review and Criticism of Mr. Fiske's Argument in Through Nature to God.

On the morning of Tuesday the alumni of the Dental Department held a clinic in the Dental Infirmary, in San Francisco; in the afternoon they held a meeting of their Alumni Association; and in the evening the alumni and graduating class of the Dental Department banqueted at the Palace Hotel. The same evening the Faculty and alumni of the College of Pharmacy tendered a banquet to the graduating class, and the Academic Alumni held their annual reception at the Mark Hopkins Institute of Art.

The Regents of the University met in Berkeley on Tuesday afternoon and voted degrees to those recommended by the Faculties. On motion of President Wheeler it was also voted to confer the honorary degree of Doctor of Laws

on William McKinley, President of the United States. On the same afternoon the annual public meeting of the Phi Beta Kappa Society was held in Hearst Hall, Professor Joseph LeConte delivering an address on The Relation of Art and Science.

The thirty-second Commencement of the University of California was held on the morning of Wednesday, May 15, 1901. In anticipation of the presence of the President of the United States extensive preparations had been made and the greater part of the athletic grounds covered with seats and a platform for the distinguished guests, the Regents and Faculties, and the graduating classes. Between nine and ten thousand persons were accommodated. After the invocation by the Right Reverend Wm. F. Nichols, Protestant Episcopal Bishop of California, the following members of the graduating classes made brief addresses: Everett John Brown, Ph.B. (Hastings College of the Law), The Law School Graduate—His Training and Opportunity; Nathan Montgomery Moran (College of Letters), Democracy in Education; Ralph Talcott Fisher (College of Letters), The Unification of University Ideals; and William Buckhout Greeley (College of Social Sciences), The Historical Spirit in Practical Politics.

Governor Henry T. Gage then presented the Secretary of State, John Hay, who conveyed a message of regret from President McKinley, who was unable to be present owing to the serious illness of Mrs. McKinley, and briefly expressed the appreciation of the Presidential party of the welcome they had received in California.

The following were then commissioned by Governor Gage:—To be First Lieutenants—Donald Thompson Baker, Johann Friederich Erdmann Clewe, Frank Evans Howard, Otto Paul Rathke, Courtney L. Barham, Franklin Underwood Bugbee, Warren Vincent Richardson, Walter Nettleton Frickstad, Laurence Lincoln Greene, Carl Schilling, Frank Lennen Mulgrew; to be Captains—Richard Warren Harvey, Benton Alvin Hammond, Frank George Goodenow, John Winchel Spencer Butler, Carl Laurence Carlson, Walter Wadsworth Bradley, James Orland Osborn, Samuel Centennial Faneuf, John Emanuel

Gustafson, Edgar William Alexander, William Buckhout Greeley, Ralph Hamilton Curtiss, Henry Clinton Melone, Eugene Wellington Roland, Elry Jay Wagor, Cornelius George Dall, Walter Everett Conlin, Jack Dietrich Hoffman; to be Majors—Ralph Talcott Fisher, Nathan Montgomery Moran, Glenn Loring Allen; to be Lieutenant-Colonel—Walter Burling Bakewell; to be Colonel—Charles William McConaughy.

The following degrees were then conferred:

The Degree of Bachelor of Science (College of Chemistry) upon:—Edgar William Alexander, Glenn Loring Allen, Coniah Leigh Bigelow, Harvey Monroe Hall, Richard Warren Harvey, Frederick Laist, *George Walter Monroe, Anna Morgan, Carl Schilling, Florence Margaret Scott, Hiram Franklin Sheldon.

The Degree of Bachelor of Science (College of Civil Engineering) upon:—J. Shirley Bright, Walter Nettleton Frickstad, Adolph Judell.

The Degree of Bachelor of Science (College of Mining) upon:—Harry Winter Bangle, Edwin Lawrence Beck, Walter Wadsworth Bradley, *Ralph Stuart Browne, Harry Louis Cornish, Ivan DeLashmutt, Carlos Parker Griffin, Melvin Scribner Griffiths, Jack Dietrich Hoffmann, Lee Sylvester Kerfoot, Edwin Ralph Leach, *Aloysius Paul Mallon, Henry Daggett Morse, Horace Lankton Moulthrop, Arthur Charles Nahl, *Vance Craigmiles Osmont, Warren Vincent Richardson, William Beaumont Schaw, Paul Selby, Howard Dunbar Smith, Richard Charles Specht, Elry Jay Wagor, Otto Charles Zinns.

The Degree of Bachelor of Science (College of Mechanics) upon:—Harley Sargent Britt, Oscar Frederick Kern, Frank Walter Kerns, Paul Lebenbaum, Claude Wilson Place, *Kurt Schluss, Charles Robert Sessions, Walter Samuel Sessions, John Stanislaus Soares, Taichi Tanabe, Edward George Thunen, Edward Ingram Titlow.

The Degree of Bachelor of Science (College of Agriculture) upon:—Julia Roselle Pearce, B.S., Mooshegh Vaygouny.

The Degree of Bachelor of Science (College of Commerce) upon:—Benton Alvin Hammond.

The Degree of Bachelor of Science (College of Natural Sciences) upon:—*Helen Louise Emilie Arents, Minnie Beatrice Bannon, May Alice Bowcher, *Paul Castelhun, Ralph Hamilton Curtiss, *Leo Eloesser, Jr., Margaret Maria Fee, Margaret Fortier, Joseph LeConte Goldsmith, Hephzibiah Elizabeth Green, Elias Marcus Hecht, Rachel Kurlandzik, Benjamin Overfield Lacey, Elisabeth Henrietta Lehr, Genevieve Savage Manchester, *Samuel Philip Maybach, *Marion Michener, Evelyn Marianne Ratcliff, Otto Paul Rathke, Lionel Samuel Schmitt, Mary Winifred Tyrrell.

* Degree conferred December 27, 1900.

The Degree of Bachelor of Philosophy (College of Social Sciences) upon:—*Joseph Everett Brand, *Carl Sophus Hansen, *Franklin Porter Nutting, Margaretta Louise Thornton.

The Degree of Bachelor of Letters (College of Social Sciences) upon:—Jewel Alexander, Elizabeth Arlett, Florence Eunice Barnard, George R. Bartlett, Theobald Percy Bayer, *Robert Belcher, Ida Body, Jessie Bohall, *George Otto Brehm, Brownie Brownell, Thomas Fairchild Brownscombe, M.A., Ella May Bunnell, John Winchel Spencer Butler, Cora Belle Campbell, Carl Laurence Carlson, Ethel Beaver Catton, *Adrienne Cerf, Lillian Gertrude Chace, Antoinette Clemence Chevret, Helen Elizabeth Clapp, B.L., Amelia Ynez Coeke, Charles Matthew Coleman, Charles Maxwell Colton, Mary Sara Cooper, Edith Pearl Cox, Josephine Devine, Lou Irene DeYo, Edward Augustus Dickson, Margaret Elizabeth Doherty, Louis Fred Dreher, *Benjamin Franklin Driver, Boutwell Dunlap, Lillian May Durkee, Muriel Eastman, Elizabeth Eby, Guy Walton Eddy, Clarence William Edwards, Thomas Henry Emerson, Claribel Ensign, Edward Thomas Ford, Lilia Gertrude Forderer, Maude Malcolm Fraser, Agnes Frisius, Edith Edna Gaddis, Leland Isaac Gale, Leonora Gautier, Mabel Emma Gilson, Marcella Catherine Glazier, Isabel Blanchard Godin, Demetrius Alexander Gordenker, Elisabeth Goyne, Ruby Estelle Gracier, Ulrich Graff, May Bess Graham, May Ellenor A. Gray, William Buckhout Greeley, Laurence Lincoln Greene, Marcella Gunning, *Karl Henrich, Margaret Frances Hill, Sophia Adelaide Hobe, Anne Lucia Holmes, Helen Lemoyne Hoose, Ph.B., Harriet Hoppin, Frank Evans Howard, Alice Orne Hunt, Hattie Handal Jacobs, May Belle Johnson, Clare Jones, Almira Jane Kelshaw, Edith Mabel Kendall, *Virginia Nason Klenck, Ph.B., Edith Rosine Kurtz, *Edward Gerhart Kuster, Katharine Maloy Layne, Elizabeth Eloise Ledgett, Harley Marion Leete, Hugh McCaskey Love, *Dolores Elenteria Machado, Harry Ellis Magee, George Peabody Manchester, Francis Freeman Marshall, Ethel Genevieve Marston, Martha Jane McDill, Edna May McKee, Lucius Dean McKinley, *Margaret McLeod, Nettie Meek, *Henry Clinton Melone, Vincenza Catherine Milledge, Mary Grace Miller, Florence Etta Montgomery, Ida Cornelia Moodey, Stanley Moore, Ruby Rose Morse, Edna Murdock, Charlotte Elizabeth Neale, Oney McCutchan Nicely, William Horsley Orrick, James Orland Osborn, Edna Tulloch Owen, Albert Wentworth Palmer, *Clelia Augusta Paroni, Gay Willis Parsons, Eva Powell, Maude Harriett Powell, Edward Augustus Powers, Caroline May Pulcifer, Ellen Kate Rea, Estelle Grace Roblin, Eugene Wellington Roland, Evangeline Sale, Milton Harry Schwartz, Elizabeth Mitchell Scupham, William James Shaw, Paul Ainsley Sinsheimer, Marion Cummings

* Degree conferred December 27, 1900.

Stanley, Jesse Henry Steinhart, Theresa Viola Stoer, Fanny May Strong, Amy Tabrett, *Olive Lord Taylor, Helena Pearl Thomas, Mabel Winifred Thomas, Margaret Troili, Richard Walton Tully, *Grace Abbie Tyrrell, Amy Gertrude Van Deerlin, Anna Frances White, Howard Collins White, Ellen Wilkinson, Mabel Lucinda Williams, Andrew McLellan Wolfenden.

The Degree of Bachelor of Arts (College of Letters) upon:—Hilda Abraham, Annie Harriet Allen, Lucile H. Bailey, Walter Burling Bakewell, James Clark Blair, Vivian Beatrice Bryan, Franklin Underwood Bugbee, Jessie Ellsworth Burnett, A.B., Blanche Maple Clark, Walter Everett Conlin, Cornelius George Dall, George Nelson Didion, Jeannette Ellison, A.B., Grace Emily Hazelton Fish, Ralph Talcott Fisher, *Alice Linscott Freese, Mary Theresa Gallagher, Frank George Goodenow, Arthur William Goodfellow, Eily Mahoney Grosjean, John Emanuel Gustafson, Fred Beckman Hart, Catharine Hirstel, Wesley Newcomb Hohfeld, Florence Edna Hoyt, Anita Giles Hubbard, Corinne Hutton, Martha Adelaide Ijams, Katherine Courtenay Johnston, *Myrtle Jeannette Joseph, Winthrop Leciester Keep, Louise Kellogg, *Mabel Earle Kelsey, Elizabeth Keyser, *Thomas Drummond Mansfield, Helen Louise Martin, Stuart Galbraith Masters, *Margaret McCowan, A.B., Herbert Turbitt Moore, Nathan Montgomery Moran, Minna Helen Nelson, Emma Estella Parker, A.B., Clara Christine Piper, Florence Mabel Preble, Fannie May Sanborn, Mary Southern Shreve, Elizabeth Jackson Skinner, Irene Taylor, Edith Grace Thatcher, Lillian Claire Versalovich, Louise Hinckley Whitehead, *Flora Wilson, Miriam May Wollner, Alice Bowman Wright.

The Degree of Master of Science (College of Chemistry) upon:—George William Beattie, B.S., (Thesis: Nernst's Theory of the Concentration Cell); William Thompson Skilling, B.S., (Thesis: Thermal Values, and Chemical and Physical Properties of California Petroleums).

The Degree of Master of Science (College of Natural Sciences) upon:—Gulielma Ruth Crocker, A.B., (Thesis: Larval Development and Metamorphosis of Astenas Equalis); Katharine Matthews Crusoe, B.S., (Thesis: The Effect of the Surrounding Atmosphere on the Spark Spectra of some Metals); Arthur Scott King, B.S., (Thesis: The Effect of the Surrounding Atmosphere on the Arc Spectrum of Carbon); *Sanford Alexander Moss, B.S., (Thesis: Thermodynamics of the Gas Turbine).

The Degree of Master of Letters (College of Social Sciences) upon:—Adeline Belle Croyland, B.L., (Thesis: A Philological and Historical Study of "L'Histoire de Guillaume le Maréchal, regent d'Angleterre de 1216 à 1219: Poème Français du XIII^me^ Siècle");

*Degree conferred December 27, 1900.

Mabel Hall Jacobs, Ph.B., (Thesis: Lessing's Dramatic Principles and their Application to Typical Elizabethan Dramas); Fanny Eliza Snell, B.S. (Carleton College), (Thesis: The Didactic Element in Victorian Poetry).

The Degree of Master of Arts (College of Letters) upon:—Louise Crennell Callow, M.A. (Western Reserve University), (Thesis: Plato's Treatment of Poets); David Raymond Curtiss, A.B., (Thesis: On the Invariants of a Homogeneous Quadratic Differential Equation of the Second Order); Richard Lenox Halsey, A.B. (Princeton University), LL.B. (Columbia University), B.D. (Chicago University), (Thesis: Present Attitude of the Japanese toward their Native Religions); Lalla Fowler Harris, A.B., (Thesis: The Origin and Growth of Plato's Logic, by W. Lutoslawski); William Inch, A.B. (University of Southern California), (Thesis: The Relative Worth of the Manuscripts of Plato's Republic); Ivan Mortimer Linforth, A.B., (Thesis: The Adverb *Iam*: with Particular Reference to the Usage of Lucretius); Francis Robert Morrison, A.B., (Thesis: The Canons of Literary Criticism); Helen Wooster Peckham, A.B. (Vassar College), (Thesis: Pope Gregory VII).

The Degree of Doctor of Veterinary Science (Veterinary Department) upon:—George John Donnelly.

The Degree of Graduate in Pharmacy (California College of Pharmacy) upon:—Marquis de Lafayette Barrett, Harry Irving Blackman, John Marvin Booher, Arthur Brett Clapp, Philip Scott Clapp, William Henry Dunlap, Orin Eastland, Oscar Harrison Edinger, Fred Chester Englesby, John William Joseph Enright, Theodore Emmet Farrell, Francis Xavier Fleming, Clark Merrill Foote, John Henry Franklin, Gustave Adolph Griesche, Fayetta Harris, John Dante Illia, John Carpenter James, Charles Laux Kitzmeyer, Herman Kronenberg, Emile Theodore Lacoste, Elmer Baker Maze, Laura Alice McCord, Herbert Leslie McDonnell, Thomas Talbot McGuire, Edward McKinlay, Frederick William Nish, George McCamley Oswill, Waldemar Bruce Philip, Robert Courtland Ramage, Stanley Herbert Robbins, Albert Frank Sidney Schmidt, John Pitt Taggart, Jackson Temple, Jr., Thomas Dollard Trueworthy, Robert Greenleaf Whitlock, Maurice John Zimelli.

The Degree of Doctor of Dental Surgery (Dental Department) upon:—George Smythe Aiken, Domenico Antonio Alberti, Charles Stuart Ayres, Adolph Baer, B.L., B.S., Julius Baer, Thomas Ira Cook Barr, John Clifford Baxter, Edward Lee Betterton, Samuel Daniel Block, Ralph Ellis Burns, Joseph Anthony Carew, Jesse Chilton, George Samuel Conner, Archibald Younger Dick, James Severino Domeniconi, Martin Espinosa, Percy De Witt Gaskill, Harry Everett Gates, Maurice Louis Green, Adolph K. Harshall, Horace Noble

Henderson, Elwood Fairbairn Herbert, Oliver Joseph Howard, Anna Lee Hudgens, Walter Ernest Janke, Charles Henry Jurgens, Henry Burton Knox, Leo Valentine Levinger, Walter French Lillard, James Albert Lindsay, Edwin Henry Mauk, James McGough, John Fred Orville McMath, Guy Stillman Millberry, Joseph Franc Novitzky, Edward William O'Brien, Eugene DeShong Painter, Percy Stuart Regnart, Edward Jack Rinckel, Guy Rogers, Ralph Bartholomew Scheier, Frank William Seydel, William Shepard, Fred James Seiferd, Frederick William Stapff, Henry Stuart Stern, John Lyons Sullivan, Anna Christina Frank Wagner, Chapman M. White, Jr., Jay Fremont Wilson, Roy Irving Woolsey.

The Degree of Doctor of Medicine (Medical Department) upon:—Edgar Allen Arthur, Wilfred Fenton Beerman, Ph.G., Kate Isabel Brady, A.B., Walter Murray Dickie, Ph.B., Ralph Orlando Dresser, John Nivison Force, B.S., Harold Phillips Hill, A.B., Reuben Chandler Hill, Mary Frances Kavanagh, Milton Byrne Lennon, M.A., John Vaughan Leonard, William Kinkade Lindsay, Rasmus Hansen Madsen, A.B., Florence McCoy, B.S., Frederic Lincoln Morong, William James Murphy, George Philip Purlenky, Ph.G., Fletcher Greene Sanborn, Lionel Samuel Schmitt, James Walter Seawell, Hadyn Mozart Simmons, Ph.G., Hudson Smythe, George William Sweetser, Ph.G., Benjamin Thomas, M.A., Joseph Michael Toner, John Lysander White, Chester Howard Woolsey, B.S., Una Yone Yanagisawa, B.L.

The Degree of Bachelor of Laws (Hastings College of the Law) upon:—Thomas Dickey Aitken, Phil Brent Arnold, Ph.B., James Hall Bishop, Thomas Porter Bishop, Ph.B., Hugh Barr Bradford, B.L., William Aloysius Breen, A.B., Everett John Brown, Ph.B., John Quincy Brown, Ph.B., Charles Marcellus Bufford, M.A., John James Callaghan, Charles Strother Chandler, A.B., Allen Lawrence Chickering, A.B., Herbert Eugene Clayburgh, Ph.B., Edward Ignatius Coffey, Samuel Milton Crim, Oliver Dibble, Ph.B., Marie Cecelia Dillon, John Wilson Douglass, Dennis Maxwell Duffy, A.B., William Ede, A.B., Perry Evans, B.L., George Franklin Gill, Alfred Ephraim Goldsten, Frank James Hennessy, A.B., Guy Hinton, M.A., Roy Gage Hudson, John Louis Armand Jaunet, A.B., Edwin McMurray, James Diven Meredith, Charles Louis Neumiller, Hartley Fiske Peart, B.L., Frank Edward Powers, Maggie Adelia Ross, B.S., Harry Francis Sullivan, Lawrence Talcott Wagner, A.B., George Erastus Weaver, William Joseph Weyand, Brooke Maynard Wright, Handel Hart Zobel.

The Degree of Doctor of Philosophy (College of Natural Sciences) upon:—Russell Tracy Crawford, B.S., (Thesis: Determination of the Constant of Refraction from Observations made with the Repsold

Meridian Circle of the Lick Observatory); Frank Elmore Ross, B.S., (Thesis: Differential Equations belonging to a Ternary Linearoid Group).

The names of the following undergraduate candidates for degrees to be conferred in 1900–01 were, by vote of the Academic Council, printed on the programme as worthy of honorable mention for distinguished scholarship:

Walter Wadsworth Bradley, College of Mining; Harley Sargent Britt, College of Mechanics; Vivian Beatrice Bryan, College of Letters (Latin, Greek); Ralph Hamilton Curtiss, College of Natural Sciences (Mathematics, Astronomy); Cornelius George Dall, College of Letters (Mathematics, Astronomy); Ulrich Graff, College of Social Sciences (German); William Buckhout Greeley, College of Social Sciences (History); Carlos Parker Griffin, College of Mining; Melvin Scribner Griffiths, College of Mining; Harvey Monroe Hall, College of Chemistry (Chemistry, Botany); Sophia Adelaide Hobe, College of Social Sciences (History); Wesley Newcomb Hohfeld, College of Letters (Philosophy, Jurisprudence); Martha Adelaide Ijams, College of Letters (Latin, French); Adolph Judell, College of Civil Engineering; Winthrop Leicester Keep, College of Letters (Latin, Greek); Benjamin Overfield Lacey, College of Natural Sciences (Mathematics, Physics); Frederick Laist, College of Chemistry (Chemistry); Harry Ellis Magee, College of Social Sciences (Jurisprudence); Genevieve Savage Manchester, College of Natural Sciences (Chemistry, Philosophy); Nathan Montgomery Moran, College of Letters (History, Philosophy); Evelyn Marianne Ratcliff, College of Natural Sciences (Mathematics, Physics); Hiram Franklin Sheldon, College of Chemistry (Chemistry, Mathematics); Jesse Henry Steinhart, College of Social Sciences (Jurisprudence); Irene Taylor, College of Letters (Greek, Latin); Mabel Winifred Thomas, College of Social Sciences (English, German); Andrew McLellan Wolfenden, College of Social Sciences (History, Jurisprudence).

The President announced that the University Medal, awarded annually to the most distinguished graduate of the year, had been awarded for 1901 to Wesley Newcomb Hohfeld, of the College of Letters.

The exercises concluded with the benediction by Bishop Nichols.

At 1 o'clock the Alumni luncheon was held in the Harmon Gymnasium. Rev. W. A. Brewer, '87, acted as toastmaster, and brief addresses were made by Governor Nash, of Ohio; C. S. Greene, '86, President of the Alumni

Association; Mrs. A. F. Morrison, '78, Hon. George W. Pierce, '75, Hon. Frederick Searls, '76, and M. H. Schwartz, '01.

With the farewell reception to the graduating class by President and Mrs. Wheeler in Hearst Hall, on Wednesday evening, the exercises of Commencement week came to a close.

CURRENT NOTES.

During the latter part of April and the early part of May six lectures on "Le Théatre Contemporain" were delivered at the University by M. Gaston Deschamps, the eminent French scholar and author, who for the last eight years has been the literary critic of *Le Temps*. The titles of the lectures were: Les Maîtres du Théatre Contemporain, La Question du Mariage, La Vie de Famille, La Question Sociale, Le Drame Héroique, and L'avenir du Théatre en France. M. Deschamps was the lecturer for 1901 of the Cercle Français of Harvard University, and his visit to Berkeley was made possible by the generosity of Messrs. James H. Hyde and C. B. Alexander of New York, and Mr. George Crocker and Prince Andre Poniatowski, of San Francisco.

The February number of the UNIVERSITY CHRONICLE contained an account of the first three University meetings of the term. The fourth was held on March 1, the speakers being Professor Elwood Mead, who explained the importance to California of the newly organized Department of Irrigation; Rev. Charles R. Brown, pastor of the First Congregational Church of Oakland, who spoke on "The Well Built Man;" and Dr. Martin, President of the Imperial University of Peking, who stated the educational needs of the Orient. At this meeting President Wheeler announced that Mrs. Phœbe Hearst had transferred

to the Regents Hearst Hall, its site, and its equipment, a gift valued at $45,700.

At the meeting of March 15 the speakers were Mr. John G. Howard, who gave an account of the University buildings contemplated in the Phœbe Hearst Architectural Plan; and Rev. Dr. Clampett, who gave reminiscences of student life at the University of Dublin. Mr. James H. Eckles, Comptroller of the Currency under President Cleveland, and Mr. Frank J. Symmes, President of the Thomas Day Company of San Francisco, addressed the students at the meeting of March 29, the former on "The Value of Reforms," the latter on "Hints from Practical Life."

The speaker at the seventh meeting, April 12, was Rev. Dr. Wm. J. Tucker, President of Dartmouth College, who expressed himself in favor of the elective system and early specialization. The final meeting of the term was held on April 19, and was planned as an occasion for the expression of college life. Brief talks were given by members of the student body on the topic "What can I do for my University?"

The summer session for 1901 will begin on June 27 and end on August 7. Courses will be offered at Berkeley by the following departments: Philosophy (one course), Education (five courses), History and Political Science (ten courses), Semitic (one course), Greek (two courses), Latin (three courses), English (seven courses), Mathematics (three courses), Physics (five courses), Astronomy (one course), Chemistry (five courses), Botany (three courses), Mineralogy (two courses), Agriculture, Horticulture, and Irrigation (twelve courses), and Physical Culture (five courses).

In addition to thirty-three members of the Faculties of the University of California, instruction will be given by John Dewey, Professor of Philosophy in the University of Chicago; James E. Russell, Dean of the Teachers' College of Columbia University; E. P. Cubberley, Associate Pro-

fessor of Education in Leland Stanford Junior University; H. Morse Stephens, Professor of Modern History in Cornell University; Barrett Wendell, Professor of English in Harvard University; Ewald Flügel, Professor of English Philology in Leland Stanford Junior University; Carlos Bransby, Instructor in Spanish in the Los Angeles High School; L. H. Bailey, Professor of General and Experimental Horticulture in Cornell University; and James M. Wilson, Irrigation Expert, United States Department of Agriculture.

Concurrently marine biological survey work will be prosecuted on the coast of Southern California by the Zoölogical Department of the University, the headquarters for the operations being at San Pedro. In connection with the work of exploration and investigation courses of instruction will be given by Professor Ritter, Professor Kofoid, and Dr. Bancroft. These investigations are made possible, financially, by coöperation with the University of Messrs. H. W. O'Melveny, J. A. Graves, Jacob Baruch, Wm. G. Kerckhoff, Wm. R. Rowland, J. H. Shankland, John E. Plater, the Los Angeles Terminal Railway, and the Banning Company, all of Los Angeles.

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LeCONTE MEMORIAL MEETING.

A memorial meeting in honor of Professor Joseph LeConte was held in the Harmon Gymnasium on the twenty-first of August. President Wheeler presided and spoke as follows:

Members and Friends of the University:

We are met together to-day that we may quicken our minds and hearts to a recognition of that spiritual university in which with Joseph LeConte we have shared and still share membership. Of such spiritual membership in a spiritual body his life here among us and his life in the larger world of letters afforded an example so fully typical that we cannot let it pass from the present into the past until we for once bid its image halt before us that we may make it and its meaning sure possessions of our memories and our lives. The university of which he was a member with us we recognize beyond a question was not an institution of buildings, or of courses, or of statutes, and as a member of it he was so much more, so immeasurably much more, than professor, or geologist, or philosopher that his connection with us and his life among us shine out as brilliant revelations and confirmations of our faith that the things which *are* lie deep behind the things we touch and see.

May this hour we spend together here serve to give us a larger understanding, a purer love for this institution in which is forever embedded the life of this pure, straight-

visioned, noble man; may it give us broader sympathies for that greater university of the higher human life and effort which lies behind the many names and forms of university organization; may it give us clearer vision and cleaner faith in that life which lying behind the forms and names of this seen and shifting present takes hold on God, eternity and the life immortal.

Addresses were then made by former President of the University Horace Davis, by Professor John Maxson Stillman, of Stanford University, by Professors Irving Stringham and William E. Ritter, of the University of California, and by Mr. Ralph T. Fisher, President of the Associated Students of the University of California for the year 1900–01.

MR. DAVIS'S ADDRESS.

It was my privilege to know Dr. Joseph LeConte for many years, but I was never brought into close relation with him until my connection with the University. He said to me one day, "We were in Harvard together a long time ago, and we ought to know one another better." It was true that in 1850 we were both pursuing post-graduate studies at Cambridge, but in different schools. We roomed near one another, but following different paths, we never met till we came together on the shores of the Pacific. I was but too happy to respond to his invitation to a better acquaintance. We met more often, and the memory of those pleasant hours, and of his cheerful, sunny, face will brighten the rest of my life. His name adds lustre to this University, and his fame reaches the limits of the world of science, but his memory belongs to those who knew him.

Not long ago I asked a friend what was the potent influence that attracted him to Dr. LeConte. He answered at once, "His human sympathy," and it seems to me these few words express the secret of his power.

With all his distinction he never lost his simplicity and

gentleness. Amid the laborious cares of his daily duties he always lent a willing ear to the humblest questioner. Love and goodness filled his heart to overflowing. His daily life was the practical expression of a soul grounded on deep religious convictions. External nature whose phenomena he delighted so much to investigate was to him only the manifestation of the indwelling God, and his own moral being rejoiced in the constant presence of the Infinite Father. Above his scientific research and beyond his philosophic speculations was the vision of the great source of light and love which cheered and illumined his life. Above all secondary causes he saw the Great First Cause which framed and guided the Universe; above and beyond all philosophical speculations he felt the Great Heart of love which throbbed in unison with his own.

He lived very close to nature, and when in his mountain camping trips he lay down to sleep under the giant trees, and looked up through their interlacing branches to the glittering stars, he thanked the Giver of all good gifts for the robe of lavish beauty he had spread over the world for the delight of his children.

The simplicity and gentleness of his heart made him susceptible to every kind act. I remember when a party of students invited him to join them in a camping trip among the Sierras. On his return I asked him how he enjoyed himself. He answered with glee, "Oh, we had a fine time. We camped out under the trees and slept in our blankets all the way. The boys were very good to me. They took care of my horse, and did the cooking and washed the dishes. I had nothing to do but to enjoy myself. Yes, the boys were good to me." And what a privilege it was for those boys.

It was a wonderful combination, that freshness of youth with the wisdom of age. To be revered by the old and at the same time to be loved and sought for by the young is a rare experience. While honors were heaped upon him—academic and scientific—to the student he was always

"Doctor Joe." He knew it, and it pleased him, and he always kept in close touch with them. They remembered his birthday with offerings of flowers, and when the day came to leave their *alma mater* to go out into the world, they carried his image in their hearts. Wherever there is a graduate of the University to-day, his tribute is going up with ours—incense upon the altar of his memory.

One day we were talking of these very things, and I said to him, "I do not envy any man his lot, but if the good Lord should say to me to-night, 'you must change places with somebody in the world; whom will you choose?' I should answer Dr. Joseph LeConte, he gets more out of life than anybody I know."

He got more out of life because he was in sympathy with the best; his sympathetic imagination sought for good rather than evil in every man. He looked for the best and the divine spark flashed forth in reply. This clothed his world with moral beauty and he lived happy in many friends.

The power of such a life is hard to estimate. For thirty years his name has been a tower of strength to the University, not simply for his scientific fame and intellectual attainments, but even more for his moral strength and beauty. His life has been woven into thousands of young expanding lives in this western commonwealth, and his cheerful hopes have lighted up their homes.

The power of such a life cannot be estimated. You have felt it. I have felt it. And the world is better that he has lived.

PROFESSOR STILLMAN'S ADDRESS.

Mr. President, Members of the University, and Friends:—

As a former pupil of Professor Joseph LeConte and as one who loved him, I am grateful for the opportunity to join in this expression of respect to the memory of our great teacher and friend. I am glad also to bear

testimony here to the profound sympathy and sense of loss felt by my colleagues of Stanford University.

It was my privilege, with many others of the earlier graduates of the University, to sit for three consecutive years under his inspiring teaching, and my further privilege as a young instructor to have for several years the advantage of a more intimate personal contact, and to benefit by his friendly advice and criticism. I may safely say that by no other teacher was I so much influenced in my ideals of scholarship and personal character as by him.

The University of California in those early days belonged to the class of small colleges. To-day it belongs to the great universities. The small college owes what advantage it has over the great university to the opportunities it offers for closer contact between its students and its great teachers. In those first years Professor LeConte gave lecture courses of a year each on Botany, Zoölogy, and Geology, and his presentation of these subjects, correlated by his remarkable generalizing power and illumined by the doctrine of evolution, formed to my mind a masterpiece of logical presentation. When, with the development of the University, there came the inevitable differentiation of teaching of those sciences, it was necessary that this lecture series should be broken up;—and while this change was in the line of progress and was conducive to the wider interests of all concerned, nevertheless it seemed to us who had enjoyed these lectures matter for regret that our successors were not to have the opportunity of hearing these related sciences presented in such beautiful sequence and with such rare eloquence.

If we earlier students missed many of the advantages which the students of this University at present enjoy, surely, looking backward, we may say that our greatest compensation lay in the longer and more intimate intercourse which we enjoyed with a few great teachers, and among these none perhaps was so generally admired and so universally loved as Dr. Joseph LeConte.

His broad scholarship, his clear and logical power of expression, his masterly method of presentation, his eloquence and enthusiasm challenged universal admiration. He was, moreover, at all times easily approachable—glad to answer our questions, or to discuss patiently and seriously our immature points of view on the profound problems of science or of the philosophy of life. He was, withal, so keenly alive to the joy and humor of life, so lenient to harmless youthful follies, could so well appreciate a good-natured jest, even if he were himself the subject of it;—was so unfailingly kind and so certainly sympathetic, that it is no wonder the unanimous student sentiment exalted him to the position which he has always held in the affections of the University community. I have often wondered that he never seemed to grudge the time so precious to him and so often thoughtlessly encroached upon by us for the mere pleasure of being with him and listening to his wise and entertaining talks and of basking in the sunshine of his gentle, kindly presence. But teaching was to him a pleasure, and it was as teacher that he was preëminent.

"You think I have done you some good," he once said, addressing the alumni. "I hope I have; but do not for a moment imagine that you have not given me as much as you have received. . . . . It is a fact that nearly every good thought I ever had was born in my mind during immediate preparation for my class lecture. . . . . But, more than this, nearly everything I ever wrote, whether of books or articles, was first given in outline, or in the form of suggestions, to my classes."

Dr. LeConte has been one of America's most distinguished scholars, In his especial field of Geology he has contributed largely to its literature, and is the author of a text-book characterized by a colleague competent to judge as by far the best short text-book in the English language. As an eloquent advocate of the theory of Evolution, and as a writer upon the philosophy of Science and Religion, he is widely known. In other branches of science his contribu-

tions are considerable. As public speaker or University lecturer he had few equals. For his services to Science he has been widely recognized and received many high honors. But Joseph LeConte was greater than these attributes and achievements imply. These alone will not explain the peculiar place he holds in the hearts of the multitude of those who as students of this University or in other ways have come under the spell of his personality. There was felt for him an affection and devotion that reputation cannot command nor the most distinguished ability compel. Fame may challenge admiration and ability command respect, but only a noble character and a loving heart can secure such universal devotion as Dr. LeConte inspired.

There was a time in the troubled past of this University when it was feared that Dr. LeConte might be induced to accept an advantageous offer from another university. I was not then resident on this coast, and in writing to him I took occasion to express my hope that he would find it to his interest to remain. His reply contained a few lines, which, as it seems to me, reveal one of the dominant motives of his beautiful life. After admitting that he had been tempted by the offer, he added:—"But I reflected that it takes a long time to get thorough hold of the hearts of a people. I have done so here and ought not to lightly change."

This motive it is that affords perhaps the key to the almost unique place held by our departed teacher in the hearts of all who knew him. His love of others and his love of their love characterized always his attitude toward all men. Over thirty years ago he wrote, under the shadow of the Yosemite summits he loved so well:

"A loving human heart is greater and nobler even than the grand scenery of the Yosemite."

He loved, therefore, to emphasize the harmonies of life rather than its discords; he loved to notice the merits of others rather than their shortcomings; he shrank from a word or deed that would wound the feelings of others;

he preferred to conciliate rather than to antagonize. In conversation always courteous, he inclined to emphasize when possible the agreements rather than the differences which existed between himself and others; expressions of contempt or want of respect for differing points of view were foreign to his simple, kind, and earnest nature. Slow to condemn, he was glad to commend, and was full of charity for human weakness and full of faith in human possibilities. It was a black sheep indeed from whom "Professor Joe" could withhold his charity and his sympathy. How many disheartened or rebellious souls have taken hold on a new courage or a higher faith under the influence of his kindly and pure spirit, we shall never know, but doubtless they are many.

The attempt to characterize in words the charm of his personality were as vain as to hope to convey in words the charm of a spring morning or of a mountain landscape. To those who knew him it will ever remain one of the precious memories of life, to those who knew him not it can be but dimly suggested.

This University will doubtless on its long roll of faithful servants have many distinguished scholars who will leave their names as deeply graven in her temple of fame for the work they have done in widening the bounds of human knowledge, or in deepening the channels of human activity, but when again shall it find the man who shall combine with such eminent scholarship and faithful service, the catholicity of culture, the poetic insight, the eloquent tongue, the warmth of human sympathy, the gentle and chivalrous spirit that characterized that great soul whose loss we here mourn.

It is a sad thought for us that these beautiful Berkeley hills, or those sublime Sierra crests he so loved, shall see his face no more; but we know that—worthy disciple of that Greatest of Teachers he followed so truly—his influence shall endure in this State of his adoption long after his memory shall have faded into tradition in this University

to which his life-work was devoted and which has repaid with affectionate devotion the whole-hearted love he bore for her.

PROFESSOR STRINGHAM'S ADDRESS.

Since our last meeting in this home gathering place where we come for mutual talk and help, an ever-present and inspiring reality has been changed to a sad though an imperishable memory; sad, because for a time we must be painfully conscious that a rare person has gone away from us to return no more; yet also joyful, because the spirit of his personality is to remain with us through all our lives, inspiring us to a generous emulation in all worthy and noble endeavors.

Let us strive for a moment to penetrate the secret of the great influence our revered teacher exerted upon our lives and thoughts here at the University as well as upon the lives and thought of the world in general. You will remember that he was fond of getting comparative views, of seeing things not merely as facts, or items of knowledge, but in their relations to other things. With him the comparative method in all study was both precept and practice;—comparative physiology, comparative psychology, comparative thought in every field. How often have we listened with delighted attention, as he sent his fancy roaming into the adjacent fields of science and philosophy, or of science and the fine arts, or of science and religion, for exemplifications of universal law; as with felicitous argument he made a group of scientific ideas answer some of the profounder questions of philosophy, of religion, or of the art of living. His was the true scientific spirit that searches for the truth, not in order that its discoverer may win victories, may secure fame, material comfort, or riches, but because the truth will help men to live the strenuous, the nobler life. Scientist he was, not in the narrow, but in the broad sense, searching for the knowledge, not of

facts but of relations, striving to place man true, not merely to his local and temporal environment, but also, and especially, to his boundless and eternal environment.

A mind imbued with this spirit cannot be satisfied with the itemized facts of knowledge; the particular is only a phase of the general, the special of the universal; law, if it be an ultimate expression of truth, cannot be true in one set of relations and false in another. These two things cannot both be possible: that true science is and that true religion contradicts its conclusions.

These principles must have been ever present in the mind of Joseph LeConte throughout the long series of discussions, continuing from the time he first came amongst us to the present, upon science, philosophy and religion and their relations to one another, which have so profoundly influenced the thought of our time, and which mark his thinking as not less philosophic than scientific.

The philosophic attitude and philosophic modes of thought were congenial to him from an early period, and he spoke and wrote with great earnestness and eloquence upon the philosophical, especially the theo-philosophical questions that lie along that borderland between science and philosophy which has been so frequently invaded by modern scientific investigation. In this field he lingered with increasing fondness as the years passed on. The familiar talks to a Bible-class in South Carolina in the early sixties grew into a series of formal lectures in Oakland in the early seventies, which were in turn embodied in book form under the title "Religion and Science" and were published in New York in 1873. This work represents the formative period of his philosophic opinions. It is pervaded by an evident feeling of hesitation, of uncertainty as to whether the reconciliations of religion and science there attempted are after all the true ones. The views there expressed had been formulated some years before, and though challenged by the new doctrine of evolution as propounded by Darwin and Spencer, they had

not yet been profoundly influenced in its favor. But a change was imminent, and it came rapidly; so rapidly, in fact, that no new edition of the old book was ever attempted, though new issues came out bearing various dates subsequent to that of its first publication. A significant fact, this, in the life history of our great friend, for he had already passed, by twenty years, the normal age at which men form definitive opinions upon religious questions, opinions which persist in spite of the forces, scientific, social, or political, which re-shape the opinions of an adolescent generation, and he had pronounced a series of judgments upon these vital matters in permanent form. But, recognizing a great responsibility, he did not shrink from the task before him, though in earlier life he had not escaped the mental agony which is the lot of those who are compelled to change their fundamental beliefs. Here are his own words: "I confess to you, that, in my earlier life, I have struggled almost in despair with this swift current. I confess I have sometimes wrestled in an agony with this fearful doubt, with this demon of materialism, with this cold philosophy whose icy breath withers all the beautiful flowers and blasts all the growing fruit of humanity. This dreadful doubt has haunted me like a spectre which would not always down. But, in later years, I have learned to see that, for a solid basis for our belief in spirit, we must not look to reason, but must return again to the clear revelations of our consciousness and the still clearer revelations of Scripture."

Thus fortified by a rigorous self-discipline he entered upon the new epoch of a career already well crowded with significant studies and experiences. He undertook and achieved the reformation of his opinions upon some of the most fundamental scientific and theo-philosophical questions of the day. And this time there was no hesitation. Henceforth there was no uncertain sound in his voice. From a doubting opponent of evolution he became its ardent champion, its most accomplished expounder. And

when the time came for him again to give public expression to his thoughts upon this great theme he spoke the following words:

"We are confident that evolution is absolutely certain. Not indeed evolution as a special theory,—Lamarckian, Darwinian, Spencerian,—for these are all more or less successful modes of explaining evolution; nor evolution as a school of thought, with its following of disciples,—for in this sense it is still in the field of discussion,—but evolution as a law of derivation of forms from previous forms; evolution as a law of continuity, as a universal law of becoming. In this sense it is not only certain, it is axiomatic." And he presses home the importance of this conclusion by the remark: "—On every important question relating to man, the theory of evolution will throw new and important light." The culmination of these later studies was his well-known work on "Evolution and its Relation to Religious Thought," a book which has probably had greater influence than any other in the English language in allaying the religious opposition to the new theory. Many of us hold in grateful memory the many public, semi-public and private talks upon the subjects discussed in this work during the months just previous to its publication. It was thus that we had share in the life and thought of Joseph LeConte.

Thus recognizing the seriousness and dignity of life, ever consciously striving for its adjustment into harmony with universal law, Joseph LeConte, out of an abundant store of knowledge in various fields, was daily speaking and writing words of grave import, and of absorbing interest to all serious men. With a rare singleness of purpose he remained true, through a life of almost four score years, to his high ideals of life and work. Singularly free from personal bias and selfish aims, he saw clearly when other men saw not because they could not or would not see. And gifted with a felicitous speech and an unusual power of clear exposition, his words charmed our

attention into expectant interest whenever the spirit moved him to give utterance to his thoughts. Amidst all the discord and tumult of contending factions, amidst angry polemic and scornful ridicule, his clear voice sounded the cry of tolerance and peace.

Painfully conscious are we to-day of the great loss we have suffered. For almost a third of a century we have had the friendship and daily counsel of a man whose thought has been able to penetrate beyond the limitations of traditional opinion and creeds into the regions where intuition and reason may work in harmony together, and to draw from thence for our inspiration some of those eternal verities which make for man's dignity and welfare. Although to the rest of mankind he was also a great teacher and a friendly counsellor,—for when Joseph LeConte spoke the world listened,—to us, his colleagues and pupils, he has been far more than these. In the class-room, in the council-chamber, in the Philosophical Union, and at the fireside, his thoughts have become our thoughts in a way that others may not know. There have been the contacts of thought with thought which strike fire and bring our intellectual and moral enthusiasms to a blaze. There have been the communings of soul with soul in that close intimacy where all affectations and artificialities cease. As he walked back and forth in our midst there was the ever-conscious, ever-abiding reality in our hearts that here was being worked out for us,—a stimulus to all higher endeavor, a reproach to all baser motives,—one of humanity's great ideals.

Through all its history the life and the personality of Joseph LeConte has been interwoven into the life of our University. Through all the vicissitudes of prosperity and adversity his unfaltering footsteps have led on towards the higher life. When the clouds darkened and the storms threatened his unperturbed spirit and steadfast purpose have beckoned us to the higher levels where lie safety and tranquillity. And because ideals are potent in the lives of

men, this one, a simple hearted, gentle mannered, noble minded personality, has become a heritage of priceless value to all of us now here, and to all who shall come after us as sharers in the benefits which this University has to bestow. And if any teacher or any student of us falters in the pursuit of his highest ideals, let him remember and take courage, let him remember that in this place, in our own university life, there has been realized one of the world's highest ideals of manhood.

PROFESSOR RITTER'S ADDRESS.

We knew while he was still with us that Joseph LeConte was a great man. We knew that he was accomplishing great works; and we honored him with a measure of honor accorded to few men. But our love for him as a human being, the warmth and inspiration of personal contact with him as he went in and out among us day by day, our admiration for the richness, the perennial freshness and vigor of his learning, so occupied us as to distract our attention from the grandeur of his life and work as a whole. The withdrawal of his personal presence sets us to scanning his life from end to end as we have not done before. And what a life we are finding!

For myself, as I range among the manuscripts, published and unpublished, which he has left, making my first serious attempt to get a comprehensive and systematized view of what he did and the circumstances and influences under which he did it, and as I read more fully into his earlier and later writings, my first feeling is one of astonishment, almost bewilderment, at the magnitude of what he achieved. Beside a half-dozen published and two unpublished books, nearly all in quite different fields of knowledge, he has left, according to his own memorandum, about two hundred published brochures. A majority of these are of considerable length, and they reach into almost every field of human thought. Fully four-fifths of all this

he did after he was forty-five years of age, after he became a member of our University.

The first really scientific paper he published bears the date of 1856. He was then thirty-three. When he came to California in 1869, at the age of forty-six, he had published about twenty addresses and papers, fully one-half of which dwelt in a more or less popular way with questions of education and art. His distinguished work was, therefore, nearly all done in our midst. The career of the Joseph LeConte of fame belongs almost wholly to California and its University, and passes now into history as indubitable proof that learning of the noblest order may flourish among us.

Like many another career of great achievement in learning, his was in many ways a contradiction to nearly all the rules we cherish for the making of scholars and teachers. Born under a social regime of the highest unnaturalness, he stands forth through his whole life as a model of naturalness and rationality; reared to manhood in the midst of an industrial system wont to look upon all labor as beneath the dignity of a gentleman, he was through his whole life one of the most incessant, joyous toilers. Receiving a college education of the strictest classical-mathematical sort, he emerged from it one of the earliest, and remained to the end of his life one of the ablest advocates of science as a means of the truest culture; with no thought whatever during the years of his apprenticeship in learning of becoming a teacher, and consequently receiving no pedagogical training, he reached an eminence as a teacher that has been attained by but few. Although he had adopted medicine as a profession and established himself in a lucrative practice, in a beautiful home amidst congenial surroundings, the inborn-force driving him toward science, with which until now he had dallied as a pleasant pastime only, could at length no longer be resisted. Within the space of a few days, during the summer of 1850, the resolution was made; the brilliantly opened medical

career was abandoned, the new home was broken up, and the eager footsteps were turned toward Cambridge, where the great Louis Agassiz was just then beginning to breathe that breath of life into American science, the later influences of which have been so mighty and far reaching. Both by his training in medicine and by his studies under Agassiz in Natural History fitted for biology rather than geology, he early relinquished most of his active work in the former science to make for himself in a few years a foremost place in the latter.

Himself of a deeply religious nature, carefully nurtured in a religious creed that held God's creative power to have been exercised directly in the production of organic species, and having this belief fortified and extended by the great authority of Agassiz, he became a convert to the evolutionary teaching of Darwin. The rôle he played in the defence of this great truth, and in robbing it of its danger to religious faith, is so familiar to the world as to need mention only, on an occasion like this.

Looking at his life in this cursory way, and from but one point of view, it might seem to have in it a considerable element of instability; but no large life can be fully seen from one direction. The truth is, stability was one of his most distinguished traits, the seeming instability was entirely that of growth and inevitable circumstance. Study his work attentively and you will find on every page he wrote, in every thought he uttered, in well-nigh every deed he did, that he was at once the prophet of Nature and the child of religion.

His scientific career began in earnest late in life. I have mentioned that at forty he had made few contributions to scientific knowledge. True. But these few contained the germs of all the best of his future work. What is strongest and what is most enduring in his scientific work is ranged around three centres:— The phenomena of sight; those of earth-crust formation and movement; and the unity of nature, the resolvability of its seemingly

multifarious forces into one force. His first publication on sight was a paper, printed in 1868, on The Adjustment of the Eyes and Combination of Images. A paper on the Theory of Formation of Continents, read at the American Association for the Advancement of Science in 1859 and published the same year, was the first of a long series on the earth-crust. Another read at the same meeting and likewise soon published, on the Correlation of Vital with Physical and Chemical Forces, was the first systematic presentation of his views, since expressed in such a variety of forms, on the oneness of all nature through the nexus of the transformability of energy. Even at the risk of its being so hasty as to have been with greater justice left undone, I cannot forbear casting a glance at his labors around each of these centres, so much is there of interest and significance in them.

His investigations in sight, particularly in binocular vision, he himself regarded as his most original and independent work, and it will probably endure in the form in which he left it longer than any other of his contributions. Here more than anywhere else he employed the experimental method. It is generally believed that he was not a laboratory scientist; and so far as regards the current meaning of the phrase, that is true. But the essence of the laboratory method is not the routine manipulation of apparatus which some room contains. It is rather the devising to some end, carrying out, and interpretation of experiments. In this sense he was in this field a constant and extremely acute laboratory investigator all his life. His experiments for testing Listing's law of parallel ocular motion, for example; as also those on the torsion and axial rotation of the eyes in convergent motion, might well serve as models for any sort of laboratory investigation. That all manner of common things—the University flag pole, its buildings, the trees, windows in his study, his lead-pencil, card notices from the Recorder's office, and a hundred other simple objects—were his apparatus, only emphasizes his readiness and skill as a deviser.

In his earth-crust studies we find better than elsewhere evidence of the perennial freshness and activity of his thought, the openness of his mind to new facts and discoveries, and the great power he had of erecting magnificent generalizations out of raw materials gathered from the most diverse sources by other toilers. Here, too, it is probable the future will recognize him to have gained his deepest original insight in both geological and biological science. His recent discussion of what he called "critical periods" in the earth's history, and of the part played by these in the evolution of the organic kingdom, are likely, it appears to me, through future investigation to prove him to have been one of the most far-seeing geologists of his time.

In the field of nature-unification, as we may call it, we find him at his best as an expositor. Although he gave to the world little or nothing wholly new in this domain, he was one of the very first to extend the ideas of conservation and correlation of energy into the realm of vital phenomena. The chapter in his life wherein is presented his relation to this subject and the theory of organic evolution is particularly interesting and significant.

The doctrine of correlation, which, as I have said, he was one of the very first to attempt to extend into organic nature, when pushed without reservation, carries organic evolution with it as a corollary. Professor LeConte stands in the public mind of to-day more eminent as an advocate of evolution than in any other capacity. As a matter of fact, however, he was very slow in accepting Darwinian evolution. At the time of the publication of his Science and Religion he was, he himself says, in his autobiography, "a very moderate evolutionist." From reading the book one can indeed hardly tell whether he was an evolutionist at all or not. This book was published in 1873. His original paper on the Correlation of Vital with Physical and Chemical Force was, as I have said, published in 1859—the very year of the appearance of the Origin of Species. At that time, as we know from his other

publications, he denied absolutely the derivative origin of species. It took him, therefore, fully fifteen years to accept, with all its implications, the doctrine into whose foundation walls he himself had placed so important a stone. We find here a strong resemblance between LeConte and Agassiz. Both obtained deep and original insights into the foundation upon which a sound doctrine of organic evolution would have to rest, and this before the doctrine itself was builded secure by Darwin; both refused for years to build upon the foundation they had helped to lay; and both were undoubtedly held back from this not so much by the theological dogmas they held, as by the depth and sincerity of their religious natures. The difference between the two was, of course, that Agassiz never came over to the evolutionary view, while LeConte did, and became one of its most ardent, consistent and lucid expounders.

But I am deputed to speak of him not merely as scientist, but also as teacher. This I am to do on behalf of the Alumni of the University—on behalf of that large body of men and women whose lives have been ennobled by having come under the dominion of his wonderful power in the class-room. But if my estimate of him has fallen so far short on the scientific side, how poor must be the best I can do on this side! Great as was his ability for searching out the hidden truths of nature, greater yet was the gift he had of bringing them into the clear light of day, and planting them as seeds to eternal life in the souls of men. This gift he himself prized higher, and cultivated more carefully and affectionately, than any other.

Drawn across the continent to California largely by what I discerned of the man through his text-book in geology, I brought to his courses a maturity of years and an acquaintance with the subjects he taught, considerably in advance of those of most college students. It is possible, therefore, that the richness and beauty of his lectures were somewhat more manifest to me than to most of his students. But what they were to me they were essentially

to all, I am sure. From the very first lecture on to the end of the course his lecture-room seemed lighted by a light different in kind from that which shone elsewhere. Not that it was so much brighter, or so much more highly colored; but something there was about it that enabled our vision to reach farther toward the confines of knowledge, to penetrate deeper into its innermost nature, than we could do by any other light our eyes had ever beheld.

The magnificent sweep of his mind in the initial laying off in general outlines of a new subject; the masterly hand with which the details were filled in; the subordination of parts according to their real values; the pointing out of differences and likenesses here and there; the drawing in of subordinate boundary lines, heavier here, more delicate there; the consummate skill with which the intricate and tangled threads of fact and argument were traced through to perfect clearness; the luminous incidental reference to the meaning of this or that point that reached beyond the limits of the topic in hand; the charming personality that permeated the whole; the original and independent, though never obtrusive, personal views; the perennial delight in intellectual activity; the delicious humor—these were among the characteristics of his lectures that made us all admire them so much. And, finally, perhaps the most distinctive trait of all, there was his profound love for all scientific truth and for the dissemination of it. "Longfellow was right," Professor LeConte recently said, "when he wrote:

> ' 'Tis the heart, and not the brain,
> That to the highest can attain.' "

Little need for him to quote another to reveal to his old students the kernel of his pedagogical creed!

Our great and beloved master has gone from among us. We enter now into the heritage of his splendid life. Let us, sons and daughters of the University, in whose hands its welfare so largely rests, determine, on the very threshold of our entrance into this heritage, what things in it we

will hold most preeious—most precious because he himself would have us so hold them; what things we shall resolve to make most potent for strengthening, upbuilding, and enobling the University he loved so well, and we love so well.

The power of truth and learning; the nobleness of disseminating it among men—these are the two greatest things for our University, for our State, in our heritage from his life. He was a great seeker in the temple of Truth; he was a great revealer of the things he found there. He was a great investigator; he was a great teacher. Concerning the greatness of his teaching by word of mouth I need say no more. From the example of his life,—the most noble of all the lessons which he taught, I piek out three things that seem to me transcendently important for us. The first is this: Some men reduce their lives to a mere withered appendage of their vocations; others make their vocations a mere appendage of their lives. Joseph LeConte made his vocation contribute to the expansion and the ennobling of his own life day by day, year by year to the very end. Every investigation he carried on, every memoir he wrote, every lecture he delivered, added something to the stature and fullness of his personal life. Again: he would not work at a thing he could not give his heart to as well as his mind. He would not be drawn far into anything where his enthusiasm and his affections could not go. Unquestionably his rich achievements in science, as well as his preëminent success as a teacher, were due largely to this trait. And finally: His teaching was the teaching of one having authority. He climbed to the very source of the river of knowledge and brought back to us water from the fountain itself. As one devoted to the cultivation of science and the teaching of science he insisted not only upon his duty, but also his right, to devote a considerable part of his time and strength to searching after new knowledge, to testing authority. He would not permit himself to become so

encumbered with a multiplicity of things so burdened with petty details of administration and daily affairs that he could not subject whatever matter he had to teach to the crucible of his best thought. Each day he claimed the scholar's most precious right—some hours alone with his thoughts. He tells us in his autobiography that although he repeated his course of lectures in geology fifty times, he never went before his class without having devoted two hours to the preparation of his lecture. And so he spoke with authority.

No incident of his teaching ever impressed me more as a student than did his maintenance of his own views as opposed to those held by others, in one of the first lectures in his course in geology, on the transporting power of flowing water. There was power unto eternal righteousness and eternal life in truth as he uttered it because he never uttered it until he had made it, in humility and sincerity, part and parcel of his own life.

MR. FISHER'S ADDRESS.

Ever since the sad news of the sixth of July spread from the Yosemite Valley through the length and breadth of our State, there has been rising a continuous tribute of love from the lips and hearts of the students of this University. To-day in these formal expressions we cannot tell the depth of this love.

But it is preëminently fitting and proper that we should come together here in memory of our beloved professor, for it is only by an interchange of thought that we can begin to comprehend his character. No really great man reveals all sides of his nature to any single individual. To one he may be an authority in scientific research, to another he may be a colleague in science, and to yet another he may bear the intimate relation of friend. It is to the honor of our beloved Professor LeConte, and to the blessing of the students of this University, that he appeared to us in this last aspect of a friend. He was our authority in science,

but above and beyond this, he was our friend. And while perhaps in future years the facts in geology which he taught may be forgotten by us, the example of his life, and the warmth of his heart will forever beckon us onward to nobler purposes. So it is that while the Regents come with a realization of their irreparable loss, and his colleagues with a feeling of sorrow, the students come with a keen sense of their bereavement.

Carlyle remarks, in speaking of the influence of one man upon another, that "No nobler feeling than this of admiration for one higher than himself, dwells in the breast of man. It is to this hour, and at all hours, a vivifying influence in man's life." Napoleon had this vivifying influence of an ideal in Caesar, and Caesar in Alexander; the familiar tale of The Great Stone Face is but an imaginative expression of the power of an ideal. How fortunate we are, then, in having an ideal about whom we might not only learn from the lips or pens of others, but whom we might see and hear, touch and know, in this formative period of our lives. It was in this personal contact that the spark was touched to many a man's dormant ambition and latent possibilities.

One mark of his greatness lay in the fascinating simplicity with which he explained the most difficult subjects in the class-room. Nothing was confused, and no subterfuge of terms was ever resorted to. He was a devotee of truth at all costs, and this conviction of the truth made possible that earnestness which was contagious throughout his classes. Another mark of the scholar was the faithfulness with which he prepared his lectures. He stated himself that he never thought of coming before a class without two hours of preparation on the work. This made his words ever fresh, and fired him with interest as of a new discovery. University students are of a critical mind; but though he was with them for over thirty years, he never lost their respect, their admiration, or their affection. This is certainly a telling record and testimony.

A beautiful tribute to his relation toward the student body is that his birthday was each year invariably remembered by some gift and some expression of their love from his pupils. On such an occasion it was not always easy to keep one's eyes dry as he responded sympathetically to the remembrance from the class. And I prize highly the letter from him acknowledging the last birthday gifts we shall ever be able to bestow. But it occurs to me that since he has been taken from us nothing could be more fitting to his memory than that the student body should, on the recurrence of his birthday in February of each year, present in his name some gift to the University whose welfare he placed above his own, and in whose service he passed away.

His devotion to the truth, his love for humanity, and his Christlike humility proclaimed as his the poet's prayer:

> "Oh! may I join the choir invisible
> Of those immortal dead who live again
> In minds made better by their presence; live
> In pulses stirred to generosity,
> In deeds of daring rectitude, in scorn
> For miserable aims that end with self,
> In thoughts sublime that pierce the night like stars,
> And with their mild persistence urge man's search
> To vaster issues."

THE HEARST MEDICAL PAPYRUS.

By G. A. Reisner and A. M. Lythgoe.

The Hearst Egyptian Expedition has acquired for the University of California an important hieratic papyrus of the fifteenth century, B.C. The roll was found three years ago by a peasant while digging *sebat* (fertilizing material) in the ruins of an ancient town. It is said to have rested in a pot of baked clay.

It consists of a roll about four meters long and seventeen centimeters wide, containing eighteen columns of hieratic texts beautifully written in red and black ink. The first page, which was inside, is broken across from top to bottom; and as the roll had not been opened in modern times, the first part must have been lost or destroyed in antiquity.

The text is similar to that of the "Ebers Medical Papyrus;" in fact many of its recipes are also in the Ebers papyrus. But our papyrus contains many variations, and most important of all, gives the receipes in an entirely different order. For example, the important incantation at the beginning of Ebers is given on page 6 of the Hearst papyrus.

By the evidence here contained it becomes certain that there was no "hermetical book of medicine" such as Ebers assumed. On the contrary these medical papyri are only loose collections of recipes gathered from many different sources, in each case, according to the opportunities and necessities of the collecting scribe.

But the Hearst papyrus contains also a number of recipes and in particular a number of incantations which are not in Ebers. On page 14, for example, are words to be recited in using different substances as medicines,—one for wheat, one for oil, one for honey and one for beer.

Taken all together, the new papyrus is one of the most interesting which has come to light in recent years, and will add much to the importance of the collections at Berkeley.

MILLENARY OF KING ALFRED THE GREAT.

DEAR SIR:—I have the honor to report to you the fulfillment of the very pleasant commission entrusted to me by the University of California. The Millenary of King Alfred the Great, celebrated last week in Winchester, was an occasion of interest and of splendor fully justifying the high anticipations which its announcement had aroused. The only features lacking to make the celebration ideally perfect were features which no human effort could have availed to supply; namely, the presence of the King who sits on King Alfred's throne, and the representation of the United States in the person of its Ambassador. The former lack, indeed, caused little remark, having long ago been accepted as inevitable. But the tragic fate of our President seems to have touched our kindred here very deeply. Nothing could be more gratifying to Americans than the quick and ready sympathy everywhere manifested throughout this kingdom. The day of the President's funeral was the second day of the celebration as planned and arranged. But with entire unanimity on the part of all concerned,—as though the matter permitted of no other solution,—all the distinctly festive features of the day were suppressed or postponed, and in their place was held a solemn memorial service in the great cathedral. This change involved great difficulty and expense, for it meant no less than the extension of the program to include a fourth day not contemplated in the original scheme; but the

difficulty and cost were cheerfully met as the only thing to do.

I shall not attempt to sketch the details of the celebration;—you are doubtless informed of them through other channels. But I may say that its elements fell very naturally into three groups, distinct, yet admirably supporting each other. First was the survey and review of the great past as embodied in the numerous monuments and institutions still surviving in and about Winchester, and in the memorials gathered there for this occasion. This part of the program was under the personal conduct of some of the most distinguished archaeologists and specialists in the realm; and to the student of antiquity this was undoubtedly the most interesting feature of the whole. Next were the social elements:—a series of functions of various degrees of formality, culminating in the splendid reception by the Mayor in the Guildhall, and the equally splendid garden party given by the Earl of Northbrook at his country-seat of Stratton. Central, of course, was the commemoration itself:—the procession, stretching the entire length of the principal street of the city; the admirable address by Lord Rosebery; the unveiling of the great statue; the banquet and speeches in the Guildhall, and the sermon in the cathedral by the Archbishop of Canterbury.

It is a matter of regret that there was so scanty a representation from the universities of the United States. Six only out of the twelve invited had delegates present. The cause, of course, was understood to be the lateness of the date to which the celebration was postponed, which made it impossible for the others to attend.

In conclusion I must express my sense of the very great courtesy which has everywhere been shown to us as representatives of the great republic beyond the sea, eldest daughter of that Anglo-Saxon kingdom and race which Alfred did so much to consolidate and to establish;—and my appreciation of the intelligent interest and sympathy

which cultivated people everywhere exhibit toward those special features of the human problem with which we in California and in the University of California are most intimately concerned.

I have the honor to remain, Mr. President,

Your very obedient servant,

CORNELIUS B. BRADLEY.

TO BENJ. IDE WHEELER, LL.D.,
President of the University of California.

LONDON, September 23, 1901.

THE SUMMER SESSION.

By T. W. Page.

The attendance at the second summer session of the University has settled forever any doubt as to whether a summer session was really worth while. When seven hundred and ninety-nine students, representing twenty-one states of the Union and two foreign countries, seek to avail themselves of the facilities provided by the University for summer work, it becomes evident that the need for such facilities is widely felt.

Nor was the student body composed of mere intellectual dawdlers who wished to spend a few easy weeks under the shade of the University oaks. The fact that about four-fifths of those that matriculated took the examinations is sufficient evidence that they were in earnest about their work. Indeed, a spirit of determination and purposeful industry seemed to pervade the whole assembly. There was singularly little of the air of easy lassitude, of the affected literary dilettantism, that are noticeable in many of our so-called summer schools. The "high seriousness" of their purpose in being here seemed to be felt by all; it was a source of sympathy that drew diverging elements into close touch with each other, developed a certain *esprit de corps*, and made it possible to speak of this very mixed assembly as a student body. For in all other respects it was a heterogeneous gathering. In age, sex, training, vocation, "race, color, and previous condition of servitude" there were almost as many varieties as nature allows.

It is of record at the Recorder's office that the average age of the students was twenty-eight. A very respectable age indeed! So much so that it is a pity to call attention to the contrast frequently presented to the instructors by the timid high school damsel and her graybeard teacher sitting side by side in the lecture-room. It is, however, true that a hundred and ninety-one of the students were at college for the first time—in other words, were preparatory students—whilst a hundred and fifty-six were graduates, not a few of whom had worn the harness of the pedagogue for over twenty years. Of the graduates fifty-six held a degree from this University, and twenty-two from Stanford; seventy-two of the rest represented no less than forty-eight institutions whose names are to be found in the University Bulletin; while six failed to give the names of their colleges. Midway between the graduates and the preparatory students there was in attendance, as we had reason to anticipate, a respectable number of undergraduates. No less than a hundred and seventy-nine were students enrolled here during the session of 1900–1901, and eighty-five more came to us from other colleges. As regards the occupation of those that were no longer regular students, it is not surprising to find that four hundred and thirty-one were teachers. The value of a summer session in enabling teachers to keep themselves *au courant* with the stream of tendency in education is too obvious to need comment. That so many of them found it possible to be in Berkeley this summer was gratifying to the authorities of the University, as it should be also to the patrons of the public schools. Besides these two great classes, the teachers and the students, there were some fifty men enrolled under other occupations. Six of them were farmers, five were clergymen, and three were "business" men, whilst the professions of the miner, clerk, physician, printer, railroad conductor, engineer, and others were more or less fully represented.

A particularly pleasing feature of the summer session

was the large number of men in attendance. And this is said, be it observed, without the slightest intention of implying anything derogatory to women students. For it is not the presence of women but the absence of men that is to be deprecated. The fact that men go in singularly small numbers to many of the summer schools established in this country, is significant of the kind of work accomplished in them. The opportunities afforded by these places have appealed mainly to the teachers that hold subordinate positions, and such positions, according to the Commissioner of Education, are now filled for the most part by women. The presence in Berkeley, therefore, of three hundred and thirty-eight male students indicates a recognition by the public that opportunities for genuine university work had been provided.

Turning now to the lines along which this work might be prosecuted we find that they were almost as numerous as those embraced in the usual curriculum of a high grade American college. The faculty was composed of forty-seven instructors, representing fifteen departments of the regular university faculty in addition to that of physical culture. In pursuance, however, of a policy adopted last year, special emphasis was laid by the authorities on the Departments of Education, History, and English, and these were strengthened by the addition of a number of distinguished instructors who came to us from other institutions. Thus in Education we had Professors Dewey of Chicago, Russell of Columbia, and Cubberly of Stanford; in History, Professor Henry Morse Stephens of Cornell, and in English, Professors Wendell of Harvard and Flügel of Stanford. Of the applied sciences, Agriculture was the one specially favored, and we were so fortunate as to secure Professor L. H. Bailey of Cornell to give a course in American Horticulture, while Judge Works, President Thomas of the Water and Forest Association, Hon. R. C. Gemmell of Utah, and Mr. Lewis A. Hicks, accepted invitations to lecture to the students on irrigation. Judging

from the enrollment in the classes it was instruction in History for which there seems to have been the widest demand. For while the registration for all the courses in English amounted to 352, and for the courses in Education to 431, it rose for the courses in History to 593. It is interesting to note, however, that technical and highly specialized as were some of the courses announced in the Bulletin, there was not one that had afterwards to be omitted for lack of students who wished to take it.

The following table will give some idea of the range and quality of the work done:

STATEMENT OF INSTRUCTION AND ATTENDANCE IN THE SUMMER SESSION, 1901.

INSTRUCTOR	COURSE	Number of Students	Number Who Took Examinations	Number Who Passed
	PHILOSOPHY.			
Dewey	1. Ethical thought of the Nineteenth Century	86		25
	EDUCATION.			
Dewey	1. Educational Psychology	123	....	54
Cubberly	2. School Administration	32	29	27
Cubberly	3. Conference on School Administration	17	17	17
Russell	2. School Administration	48	43	24
Russell	3. Conference on School Administration	23	20	16
Heaton	4. Theory and Practice of Teaching	113	68	60
Heaton	5. Conference on the Theory and Practice of Teaching	75	49	44
	HISTORY AND POLITICAL SCIENCE.			
Stevens	1. History of British Rule in Asia	105	68	67
Stevens	2. History of British Colonies and Colonial Policy	134	76	76
Bacon	3. Europe in the Nineteenth Century	41	14	14
Bacon	4. The Beginning of the Middle Ages	73	23	20

STATEMENT OF INSTRUCTION, ETC.—*Continued.*

INSTRUCTOR	COURSE	Number of Students	Number Who Took Examinations	Number Who Passed
	HISTORY, ETC.—*Continued.*			
Page	5. Economics	26	11	8
Page	6. History of the United States	69	36	27
Ferguson	7. History of Greece	41	19	14
Ferguson	8. History of Rome	41	18	16
Boke	9. American Dependencies	20	6	5
Boke	10. Constitutional Government of the United States	43	18	14
	SEMITIC.			
Margolis	1. The Relationship of the Indo-European, Semitic, and Egyptian Families of Language	2	1	1
	GREEK.			
Allen	1. Beginners' Course	13	No ex.	
Clapp	2. Xenophon and Homer for Teachers	13		4
	LATIN.			
Merrill	1. Virgil's Aeneid	35	No ex.	
Merrill	2. Horace's Odes	15		4
Merrill	3. Terence's Adelphoe	13		6
	ENGLISH.			
Flügel	1. Historical Grammar of the English Language	22	18	17
Wendell	2. English Composition	126	49	2
Flügel	3. Interpretation of the Prologue to the Canterbury Tales	26	26	26
Flügel	4. Lectures and Interpretations	4	4	4
Wendell	5. English Literature of the Elizabethan Period	98	48	41
Sanford	6. History of English Literature	31		6
Sanford	7. History of English Literature	45		6
	SPANISH.			
Bransby	1. Introductory Spanish	92	43	38
Bransby	2. Advanced Course	28	11	8

STATEMENT OF INSTRUCTION, ETC.—*Continued.*

INSTRUCTOR	COURSE	Number of Students	Number Who Took Examinations	Number Who Passed
	MATHEMATICS.			
Lehmer	1. Analytic Geometry	24	22	10
Lehmer	2. Differential and Integral Calculus	12	12	3
	ASTRONOMY.			
Townley	1. General and Practical Astronomy	6	5	5
	PHYSICS.			
Drew, Boynton, Sheldon, Hall, and Gray	1. Introductory Physics	71	.....	58
	2. (Equivalent to the Laboratory Work of the Freshman course)	46	.....	17
	3. (Equivalent to the Laboratory Courses of the Sophomore year)	18	.....	3
	4. Lectures, with experimental illustrations on the subject of Light	20	.....	9
	5. Laboratory work upon special problems; for advanced students	3	.....	3
	CHEMISTRY.			
Booth	1. Elementary Analysis	49	36	34
Booth	2. Qualitative Analysis	19	13	8
Blasdale	3. Quantitative Analysis	27	22	20
Blasdale	4. Physiological Chemistry	5	2	2
	BOTANY.			
Bailey	1. Principles of Nature Study	129	100	100
Osterhout	2. Introduction to Plant Physiology and Morphology	49	28	28
Osterhout	3. The Living Plant and its Environment	61	42	38
	MINERALOGY.			
Eakle	1. Systematic and Descriptive Mineralogy	21	15	13
Eakle	2. Determinative Mineralogy	18	16	16

STATEMENT OF INSTRUCTION, ETC.—*Continued.*

INSTRUCTOR	COURSE	Number of Students	Number Who Took Examinations	Number Who Passed
	AGRICULTURE, HORTICULTURE, AND IRRIGATION.			
Hilgard	1. Physics and Chemistry of Plants and Their Application	11	5	5
Loughridge	2. Physics and Chemistry of Soil	10	2	2
Bailey	3. American Horticulture	25	18	18
Wickson	4. California Fruit Growing	13	3	3
Wickson	5. Pacific Coast Irrigation Practice	13	4	4
Wilson	6. Irrigation	13	3	3
Wilson	7. Special Lectures on Irrigation	13	3	3
Bioletti	8. Nature and Treatment of Plant Diseases	13	3	3
Jaffa	9. Human Foods	22	8	8
Jaffa	10. Feeding Farm Animals	9	1	1
Anderson	11. Breeds and Breeding	10	4	4
Anderson	12. Milk and its Products	12	5	4
	PHYSICAL CULTURE.			
Magee and Mrs. Magee	1. Theory of Physical Culture	7	5	5
Magee	2. Exercises Adapted to the Public Schools	7	4	4
Reinhardt	3. Physiology of Exercise	7	3	3
Magee and Reinhardt	4A. Practice—For Men	16	4	4
Magee and Mrs. Magee	4B. Practice—For Women	43	53	41

UNIVERSITY RECORD.

By Victor Henderson.

To Joseph LeConte there can be no successor. The chair of Geology and Natural History, left vacant by his death, will so remain. The departments of Zoölogy and Geology, at the head of both of which he stood, will henceforth be quite distinct.

It was in the Yosemite Valley, in his camp under the shadow of Glacier Point, that Professor LeConte died, on July 6, 1901. The fatal illness,—an affection of the heart,—was of only a few hours' duration. Until the very day of his death, at the age of seventy-eight, his vigor of mind and body, and his characteristic freshness of interest and sympathy, were marvelously preserved.

Funeral services were held at Professor LeConte's home in Berkeley and at Hearst Hall on Tuesday afternoon, July 9. The Right Rev. William Ford Nichols, D.D., Bishop of California, and Rev. George E. Swan, Rector of St. Mark's, officiated.

The University celebrated memorial services in the Harmon Gymnasium on August 21. Addresses* were made by former President Horace Davis; John Maxson Stillman, Professor of Chemistry in Stanford University; Professor Irving Stringham; Professor William E. Ritter, and Ralph T. Fisher, President of the Associated Students during the year 1900–01. President Wheeler presided.

*For the addresses see pages 241 to 264 of this number.

From learned societies, universities, public men, alumni, and friends in many parts of the world came messages of sorrow. The periodicals were full of tributes of honor and affection. The "Requiem," by Dr. Edward R. Taylor, is a noble exemplar of the many memorial poems.

Dr. LeConte's own story of his life,—of his childhood on a plantation in Liberty county, Georgia; of his studies in the University of Georgia and in the College of Physicians and Surgeons in New York; of his life as a physician in Macon, Georgia, from 1845 to 1850; of his work at Harvard under Agassiz; of his life as a professor in Oglethorpe University, in the University of Georgia, and in South Carolina College; of his experiences in the troublous days of the Civil War, when he was a Confederate Army chemist; of his membership in the University of California from 1869 to 1901; of his scientific excursions from the Florida reefs to the then unvisited headwaters of the Mississippi, from Death Valley to the Fraser river; of the honors paid to him by universities, learned societies, scientists, and the world at large,—this story of his life is told in an autobiography of some two hundred thousand words completed last winter while Dr. LeConte was visiting his daughter in Georgia. Among other manuscripts in the care of his daughter, and literary executor, Miss Caroline LeConte, are a Confession of Faith, diaries, a journal of experiences during the last days of the Confederacy, and a great number of addresses, papers on philosophical and scientific subjects, and miscellaneous memoranda.

The bulk of Professor LeConte's library, together with an index rerum which represents his scientific reading for half a century, has been presented by his family to the University Library.

Even amid the rapid changes of a university community, Professor LeConte's memory will flourish with the abiding life of the great live oak dedicated on Class Day of 1898 to him and to his brother, President John LeConte. The graduate fellowship fund which commemorates the two

brothers has started and will start many a student toward a scientific career. Professor LeConte's birthday, for a number of years past an occasion for the bringing of gifts and the outpouring of affection, will be commemorated hereafter on the recurrence of each 26th of February by the giving to the University of some student gift.*

MEMORIAL SERVICE FOR PRESIDENT McKINLEY.

Again the University assembled for a memorial service on Thursday morning, September 19, now for William McKinley, President of the United States. The solemnity of the occasion was heightened by the recollection that only a few months before the University had made all preparation to receive the President upon its Commencement Day, and that, although his presence had at the last moment been rendered impossible by Mrs. McKinley's well-nigh fatal illness, the degree of LL.D. had been conferred upon him as "a statesman singularly gifted to unite the discordant forces of government and mould the diverse purposes of men toward progressive and salutary action; a magistrate whose poise of judgment has been tested and vindicated in a succession of national emergencies; good citizen, brave soldier, wise executive, helper and leader of men, exemplar to his people of the virtues that build and conserve the state, society, and the home."

The churches and all the people of Berkeley united with the University. After a service conducted by the Rev. George E. Swan, rector of St. Mark's; the Rev. Dr. Hiram Van Kirk, President of the Berkeley Bible Seminary, and

* Further biographical material concerning Professor LeConte, published at the time of his death, may be found in the memorial number of the *University of California Magazine*, for September, 1901; in the articles by Professor Josiah Royce in the *International Monthly* for September, 1901; by Professor Andrew C. Lawson in *Science* for August 23, 1901, and in an article in the *Land of Sunshine* for October, 1901. See also, for an account of his father and his childhood, *Biographical Memoir of John LeConte*, by Joseph LeConte, in the *Biographical Memoirs of the National Academy of Sciences*, Vol. III, pp. 371–393, and, for his ancestry, *ibid.*, Vol. II, p. 263.

the vested choir of St. Mark's, addresses* were made by President Wheeler, the Rev. C. K. Jenness, pastor of Trinity Methodist Episcopal Church, and Rev. George B. Hatch, pastor of the Berkeley First Congregational Church. Rev. Father Michael O'Riordan, pastor of St. Joseph's Catholic Church, read the closing prayer. President McKinley's favorite hymns were sung by the people. University exercises were suspended throughout the day. The University flag was flown at half-staff for thirty days.

NEW DEPARTMENT OF ANTHROPOLOGY.

The archaeological researches for the University of California, which, through the munificence of Mrs. Hearst, have been in progress for some years in various parts of the world, have grown to such extent, diversity, and importance, that for their better direction and coördination a Department of Anthropology has been constituted by the Regents. When it was announced to the Board on September 10 that the maintenance of the anthropological work, which at present requires some $50,000 a year, would entail no expense upon the University, it was proposed that the department be known by the name of its founder. At Mrs. Hearst's personal request, the Regents relinquished this plan.

The University has been so fortunate as to receive the aid of some of the best specialists in the country as members of the Advisory Committee which for the present will direct the work of the department. Dr. Frederic W. Putnam, Peabody Professor of American Archaeology and Ethnology and Curator of the Peabody Museum of Harvard University, and Curator of the Department of Anthropology in the American Museum of Natural History of New York, is chairman of the committee. The other members are Dr. Franz Boas, Professor of Anthropology in Columbia University, Curator of the Department of Ethnology of the

* The addresses at the McKinley Memorial Service will be printed in the November number of the UNIVERSITY CHRONICLE.

American Museum of Natural History of New York, and Honorary Assistant in Charge of Linguistics of the Bureau of American Ethnology, Washington; Mrs. Zelia Nuttall, Honorary Assistant in Mexican Archaeology in the Peabody Museum; Miss Alice Cunningham Fletcher, Thaw Fellow and Assistant in American Ethnology in the Peabody Museum; Dr. John C. Merriam, Assistant Professor of Palaeontology and Historical Geology, secretary of the committee; President Wheeler, and Mrs. Hearst. Mr. G. J. M. E. d'Aquin is Assistant Secretary and Executive Officer.

For the present the department will be wholly one of research. When the museum and the anthropological library shall have attained the necessary development, instruction will be offered. The expeditions and purchasing agents at work in many lands have already gathered together a vast amount of important and valuable material.

The University's Egyptian excavations have been in progress since September, 1899, under the direction of Dr. George A. Reisner, who has been assisted by Mr. Lythgoe and Mr. Green. Dr. Bernard P. Grenfell and Dr. Arthur S. Hunt conducted excavations for the University in the Fayoum, with very notable success. Dr. Reisner returned to Egypt in September to inaugurate the winter campaign. He spent the summer in Göttingen and Berlin, at work upon the first volume of the publication which is to record the results secured in Egypt.

The museum of Greek, Roman, and African antiquities will have as its nucleus the collections made by Dr. Alfred Emerson during the past two years. Dr. Emerson went again to Italy in September in search of material. His collections are particularly full in vases, terra cottas, ancient glassware, and bronze.

Dr. Max Uhle will spend five years in Peru. His work at Huamachuco, at Vivacochapampa, and in the Department of Ica has yielded considerable collections, and much information of scientific value. Captain Sydney A. Cloman,

formerly Professor of Military Science, has kindly undertaken to expend sums provided by Mrs. Hearst for the purchase of objects illustrative of Philippine ethnology. Various collections representing aboriginal life in California have also been made or purchased for the University.

The proper use and exhibition of the archaeological collections will require a large amount of museum space. For the present all the objects intended for the museum will be recorded, and stored in a temporary fire-proof building of corrugated iron. This structure is now in process of erection on the northeast corner of the recently purchased Hillegass tract. It is believed that the knowledge that so long as these valuable and significant collections remain stored they will be well-nigh useless will hasten the erection of a permanent museum building.

In an attempt to rescue, before it is too late, the rapidly fading remnants of knowledge concerning the aboriginal inhabitants of California, the Department of Anthropology has undertaken a work of the highest scientific importance. More Indian languages are spoken to-day in California than in all the other States of the Union taken together. Soon these languages will be extinct. Some tongues are spoken now by only half a dozen individuals. A great many Indian languages have vanished since California became a State.

Alfred L. Kroeber, Ph.D. (Columbia), already known for his valuable work among the Arapahoes, has begun researches in linguistics, folk lore, and ethnology among the Indian groups dwelling in Trinity county, north and west of the regions of the Pomo and the Maidu. Mr. Pliny Goddard is at work in the same general region, among the Athabascan tribes near the Pomo Indians. Each is provided with funds for the purchase of ethnological material.

Research has also been undertaken by the Department of Anthropology, under the personal direction of Professor Putnam and Professor Merriam, into the question of the

antiquity of man in California. Geological and palæontological methods will be used in attacking this problem.

Mrs. Nuttall, of the Advisory Committee, will devote the next five or six years to gathering for the University books, casts, squeezes, plans, photographs, and collections which will, she hopes, make Berkeley the best place available for the study of Mexican and Central American antiquities. She will bequeath to the University her private library and collections. Mrs. Nuttall is one of the first specialists in the world in these subjects. Her discovery and publication of the most important Aztec manuscript known,—there are but eight others,—and the recent publication by Harvard University of her book, "The Fundamental Principles of New and Old World Civilizations," have won for her a high scientific reputation.

While the Department will for the present offer no regular instruction, lectures will from time to time be given in Berkeley under its auspices. Three members of the Advisory Committee have already thus spoken at the University, Professor Putnam on September 20 on "The Plan and Purposes of the Department of Anthropology," Miss Fletcher on October 1 on "The Practical Value of Ethnology," and Mrs. Nuttall on October 10 on "Mexican and Central American Archæology."

Ample provision will be made by the Department for the publication of the results of research. The first volume of *The Archaeological Publications of the University of California* is now on the press of Henry Frowde, London. This volume, "The Tebtunis Papyri," is edited by Bernard P. Grenfell, D.Litt., M.A., Fellow of Queen's College, Oxford; Arthur S. Hunt, D.Litt., M.A., Fellow of Lincoln College, Oxford, and J. Gilbert Smyly, M.A., Fellow of Trinity College, Dublin. It will give to the world the contents of papyri of the later Ptolemaic Period found at Umm el Baragat, the ancient Tebtunis, in the course of excavations for the University of California. There will be five volumes, in all, of these papyri.

The Hearst Medical Papyrus, with an introduction, the hieratic text, and a vocabulary, edited by Dr. G. A. Reisner and Mr. A. M. Lythgoe, will soon go to the press of J. A. Hinrichs in Leipzig.

MERGING OF THE MEDICAL DEPARTMENT.

The Medical Department has now, by action taken by the Regents on October 8, been fully merged in the University. Its separate Board of Trustees was some time ago discontinued. From January 1, 1902, all medical funds will be administered by the Regents. The department is now legally on the same basis as all the Berkeley departments.

The establishment on an academic basis of the new Department of Anatomy marks a distinct advance in the development of medical education in California. As is true also of the Department of Pathology, which is supported largely by Mrs. Hearst, this is to be a department not only of instruction, but of research. As in the Department of Pathology, the staff will devote their entire time to academic work, and will not engage in private practice. The Department of Anatomy is supported by an appropriation from the general University fund amounting, for the year 1901–02, to $5,000, supplemented by medical funds.

Dr. Joseph Marshall Flint has resigned his position as Associate Professor of Anatomy in the University of Chicago to accept the headship of the new department. Dr. Flint was in San Francisco last spring as a member of the commission sent by the United States Marine Hospital Service to investigate the presence of the plague in Chinatown. In 1899 he accompanied the medical expedition sent to the Philippines to study tropical diseases, and from the Philippines went on to China and India to observe the plague. Dr. Flint was born in Chicago in 1872, prepared for college at Lake Forest Academy, studied at Princeton for two years, graduated from the University of Chicago in

1895, studied abroad in 1895–96, in 1900 graduated in medicine from Johns Hopkins, and also received the master's degree from Princeton, and studied at Leipzig during the summer of 1900 with His, Spalteholz, and Marchand.

Dr. Flint will be aided by Dr. Irving Hardesty as instructor, and by Dr. Robert Orton Moody as assistant in anatomy. Dr. Hardesty took his Ph.D. at Chicago. He has published a number of papers on physiological and neurological topics, and is an experienced investigator. Dr. Moody was born in Buffalo in 1864, received the degree of B.S. from Cornell in 1891, and of M.D. from Yale in 1894; had charge of all the work in histology in the Yale Medical School from 1891 to 1893; spent the year 1894–95 in graduate study in New York; practiced medicine for five years in New Haven, at the same time serving as assistant in pathology in the Yale Medical School; and from 1900 until his coming to California was assistant in Anatomy at Cornell.

Among other changes in the Medical Department are the resignation of Dr. Benj. R. Swan as Professor of the Diseases of Children, and the appointment of Dr. W. B. Lewitt as his successor, and of Dr. Thomas W. Huntington as Professor of Clinical and Operative Surgery.

CHANGES IN THE FACULTY.

The most notable new appointment in the colleges at Berkeley is that of Dr. Hugo Karl Schilling as Professor of the German Language and Literature. Dr. Schilling comes from Harvard, where, since 1891, he has been Assistant Professor of German. As a member of the special Committee on Entrance Requirements which was at work from 1896 to 1898 he had perhaps a more important part than anyone else in determining the relations of Harvard and the secondary schools, and in shaping the trend of secondary education in New England. His relation to the students at Harvard was intimate, and his services on the

Administrative Board long. Dr. Schilling for the past two years has been editor of the Germanic department of Modern Language Notes. He is the author of "König Aelfred's angelsächische Bearbeitung der Weltgeschichte des Orosius," and of numerous contributions to German and English philological journals. He is now at work on an edition of Schiller's "Wallenstein." He was born in Saalfeld, Thuringia, Germany, in 1861, studied in the Saalfeld Gymnasium, was at the University of Leipzig from 1878 to 1880, in 1880 went to England, in 1882 to Paris, and in 1883 returned to Leipzig, where, in 1885, he received the degree of Ph.D. In 1886 he went to Springfield, Ohio, as Professor of Modern Languages in Wittenberg College. In 1891 he was called to Harvard. The year 1897–98 he spent in Berlin.

Mr. Chauncey Wetmore Wells, who has been appointed Assistant Professor of English Composition, will devote a large share of his time to individual conferences with students, and to personal criticism and advice in regard to their written work. Professor Wells was born in Baltimore in 1872, prepared for college at Phillips Academy, Andover, Mass., and graduated (B.A.) from Yale in 1896. He was chairman of the Board of Editors of the Yale Literary Magazine. In his senior year he was Reader in Rhetoric, and the following year Assistant. From 1897 until he resigned to come to California he was Instructor in Rhetoric at Yale.

The new Department of Irrigation now has as its staff Elwood Mead, M.S., C.E., Professor of the Institutions and Practice of Irrigation, and James Maxwell Wilson, C.E., Assistant Professor of Irrigation. Professor Wilson is connected with the United States Department of Agriculture as Irrigation Expert. He was born in Indiana in 1846, graduated from the Illinois State Normal School in 1872, and received the degree of C.E. from the Rensselaer Polytechnic in 1887. He was Superintendent of Public Schools in Carthage, Illinois, from 1869 to 1871, and in

Bloomington, Indiana, from 1872 to 1875; Professor of Mathematics in the Indiana State Normal School from 1876 to 1882; and in Hastings College in 1883; taught mathematics in Rensselaer Polytechnic from 1884 to 1887; engaged in engineering practice from 1888 to 1895; was in charge of the department of mathematics of the Omaha High School from 1895 to 1897; and from 1897 to 1899 was State Engineer of Nebraska.

Harry A. Overstreet, A.B., 1899, received the degree of B.Sc. from Oxford in June, after two years of study at Balliol, and has returned to Berkeley as Instructor in Philosophy. Mr. Overstreet was Carnot Medalist, and one of the first five men elected to Phi Beta Kappa in the University of California.

Dr. Louis T. Hengstler has resigned his Assistant Professorship of Jurisprudence in order to engage in private practice of the law in San Francisco, but he will continue his connection with the University as Lecturer in Law. Two other Lecturers in Law have been added to the staff—Mr. William B. Bosley, B.A., Yale, 1892; LL.B. (summa cum laude), Yale, 1894; (he was a member of Phi Beta Kappa at Yale); Assistant Professor of Law in the Hastings College of the Law from 1895 to 1899, Special Lecturer from 1899 to 1901, and author of a number of legal papers published in the Yale Law Journal; and Mr. Warren Olney, Jr., A.B., California, 1891; A.B., Harvard, 1892; LL.B., California, 1894; Assistant Professor of Law in the Hastings College of the Law from 1895 to 1901. Mr. William H. Gorrill comes into the department as Instructor in Law. Mr. Gorrill received the degree of A.B. from the University of California in 1895; of LL.B. from Harvard in 1899, and of A.M. from Harvard in 1900; was Assistant in Government at Harvard in 1899, and in 1900 was appointed Honorary Instructor in Jurisprudence in the University of California.

Dr. Gaillard T. Lapsley comes to Berkeley as Instructor in History. Since January, 1901, he had been Assistant

Professor of History at Stanford. Dr. Lapsley received the degree of A.B. from Harvard in 1893, of A.M. in 1894, and of Ph.D. in 1897. In 1894–95 he studied abroad, and then returned to Harvard as Assistant in History. During 1898–99 he pursued research in the Public Record Office in London. The result was his "The County Palatine of Durham," published in the series of Harvard Historical Studies in 1900. Dr. Lapsley was for a year and a half Instructor in History at Harvard. He is a member of Phi Beta Kappa.

Three new instructors have entered the Latin department—Dr. Thomas Stanley Simonds, Dr. John William Basore, and Dr. Henry Washington Prescott.

Dr. Simonds took the degree of A.B. at Harvard in 1884, and of Ph.D. at Johns Hopkins in 1896. He was Professor of Latin at Hobart College from 1897 to 1899, and at Trinity College from 1899 to 1901. Dr. Simonds was at Oxford and in Germany while at work upon his book, "The Themes Treated by the Elder Seneca."

Dr. Basore received the degree of A.B. from Hampden-Sidney College in 1893, and of Ph.D. from Johns Hopkins in 1899. He spent the winter semester of 1900–01 at Leipzig, and studied also in Milan and Paris. In 1898–99 he was Fellow in Latin at Johns Hopkins, and in 1899–1900 Professor of Latin in Hampden-Sidney College. Dr. Basore's thesis, on "The Scenic Value of the Miniatures in the Illustrated Manuscripts of Terence," forms part of the Gildersleeve Memorial Volume. He was a member of Phi Beta Kappa at Johns Hopkins.

Dr. Prescott graduated from Harvard, where he was a Phi Beta Kappa man, in 1895; took his A.M. in 1896, and his Ph.D. in 1901. He was Instructor in Latin at Trinity in 1898–99, and Instructor in Greek and Latin at Harvard from 1899 to 1901. He has published, in Nos. IX and X respectively of the Harvard Studies in Classical Philology, "The Scene-Headings in the Early Recensions of Plautus," and "A Study of the Daphnis Myth."

Instruction in the Slavic languages is offered for the first time by Dr. George Rapall Noyes, who comes to Berkeley as Instructor in English and Russian from the University of Wisconsin, where, since 1900, he has been Assistant Professor of English. Dr. Noyes was born in 1873 in Cambridge, Mass., was prepared for college at Phillips Academy, Andover, was a Phi Beta Kappa man at Harvard, and there received the degree of A.B. in 1894, of A.M. in 1895, and of Ph.D. in 1898. From 1898 to 1900 Dr. Noyes studied at the University of St. Petersburg as John Harvard Fellow. He has this term eight students in elementary and one in advanced Russian. Later he will offer courses in Polish.

Mr. Carlos Bransby has been appointed Instructor in Spanish. Mr. Bransby was born in Bogotá, Colombia, in 1848, and received a thorough Spanish education in the school of Santo Tomás de Aquino and the Colleges of Nuestra Señora del Rosario and San Bartolomé Bogotâ. In 1870 he came to this country as special agent to convey a treaty made between the United States Minister at Bogotá and the Government of Colombia. He graduated from the New Jersey State Normal School in 1871. From 1871 to 1874 he studied at Lafayette College; from 1874 until his graduation in 1877 he studied in Union Seminary, and in 1883 he received the degree of M.A. (in course) from Lafayette. Mr. Bransby was a lecturer from October, 1877, to May, 1878; a pastor from May, 1878, to December, 1886; and a teacher of Spanish from 1887 to 1901 in the McPherron Academy, the Los Angeles Ladies College, Occidental College, and the Los Angeles High School. He is the author of a number of text books and translations.

After a year's absence in Germany, where in June he received the degree of Ph.D. from the University of Göttingen, Dr. Charles A. Noble, (B.S., '89), has returned to Berkeley as Instructor in Mathematics.

Dr. Thomas Milton Putnam, who was Fellow in Mathematics in 1897–98, and Assistant the following year, and

Instructor in Mathematics in the University of Texas in 1899–00, has returned to Berkeley as Instructor. He received the degree of B.S. in 1897 and of M.S. in 1899 from the University of California, and in 1901 took the degree of Ph.D. at Chicago, where during 1900–01 he was a Fellow. He was born in Petaluma in 1875.

Dr. George Kimball Burgess, Instructor in Physics, was born in Massachusetts in 1874; graduated (B.S.) from the Massachusetts Institute of Technology in 1896; studied at the University of Paris from 1898 to 1900, and in 1901 received the doctor's degree (mention très honorable). His thesis, "Recherches sur la constante de gravitation," was prepared under the direction of Lippmann. From 1896 to 1898 Dr. Burgess was Assistant in Physics in the Massachusetts Institute of Technology, and for the next two years traveling fellow. During the past year he was Instructor in Physics in the University of Michigan.

Two new instructors have entered the Department of Chemistry—Dr. Henry Chalmers Biddle and Dr. William Conger Morgan. Dr. Biddle was born in Illinois in 1869, took the degree of A.B. at Monmouth College in 1891, and of Ph. D. (magna cum laude) at Chicago in 1900. He was Professor of Chemistry and Physics at Monmouth College from 1892 to 1898; fellow in Chemistry at the University of Chicago from 1897 to 1899; Professor of Chemistry in Maryville College in 1899–1900, and Assistant in Chemistry at Chicago in 1900–01.

Dr. Morgan was born in Albany, New York, in 1874, received the degree of B.A. from Yale in 1896—he is a member of Phi Beta Kappa and of Sigma Xi—and of Ph.D. in 1899, being Silliman Fellow during his graduate course. He was Professor of Chemistry in Washburn College from 1899 to 1901.

After a year and a half of graduate study at Columbia and of scientific work on the Atlantic shore, Harry Beal Torrey, B.S., '95, and M.S., '98, has returned to his former position of Instructor in Zoölogy.

Mr. Charles Curtis Major has been appointed Instructor in Steam Engineering. Mr. Major was born in Pennsylvania in 1869, received the degree of M.E. from the Bloomsburg State Normal School in 1891, studied in the Wyoming Seminary and at Cornell University, engaged in engineering practice, and in 1899 and 1900 was Instructor of Mechanical Engineering at Cornell.

Mr. J. Henry Dye, Instructor in Civil Engineering, is to devote his attention particularly to problems of municipal engineering. Mr. Dye graduated from the University of Michigan in 1895; went to Korea, where for three years and a half he was Civil Engineer for the Korean Government, and during the past year had charge of the work of the State University of Nevada in university extension in mining.

Dr. Archibald Robinson Ward, Veterinarian in the College of Agriculture, was born in Ithaca, N. Y., in 1875; received the degree of B.S. (in agriculture) from Cornell in 1898, and of D.V.S. in 1901. While Assistant in Dairy Bacteriology in the Cornell College of Agriculture, from 1898 to 1901, Dr. Ward published a number of veterinary bulletins. He is a member of Sigma Xi.

Mr. Charles Chapel Judson, who has become Instructor in Drawing, has for the past three years been Assistant Professor of Drawing in the Mark Hopkins Institute of Art. Mr. Judson was born in Detroit, Michigan, in 1864; studied for two years in Munich and Paris, and for four years at the Mark Hopkins Institute of Art, where he received the gold medal for life drawing,—the highest honor obtainable by a student of the Institute.

Professor Bernard Moses has been granted a second year's leave of absence in order that he may continue his labors as a member of the United States Philippine Commission. Professor Rising is in Paris, Professor Brown at Harvard, and Professor Bradley in Europe. During the first half of 1902 Professor Slate will be absent on leave. Dr. Clifton Price is in Italy.

After a year's leave of absence spent in engineering

practice in San Francisco, Professor Cory has returned as head of the Department of Mechanics. Professor Jones has returned from a year spent mostly in Paris and London, Professor Woodworth from a year at Harvard, Professor Lange from a year in England and Germany, and Professor Plehn from a year in Manila, where he served as Statistician for the United States Philippine Commission.

Dr. Herbert M. Hopkins during the summer resigned his position as Instructor in Latin to become Professor of Latin in Trinity College. Mr. Frederick T. Bioletti has resigned his position as Instructor in charge of Viticulture, Olive Culture, and Bacteriology, and will go to South Africa to become Instructor in Viticulture and Fruit Culture in the Government School of Agriculture at Elsenburg, Mulder's Vlei, Cape Colony. His going is a serious loss to the viticultural interests of the State, and to the University.

Mr. Lincoln Hutchinson spent the summer in Germany, preparing for the courses in Geography to which his time will hereafter be devoted. Dr. Moore spent the summer in Italy. Hereafter his work will be wholly in Education, instead of half in Education and half in Philosophy.

Professor Gayley and Professor Lange represented the University at the celebration of the ninth jubilee of the University of Glasgow. Professor Gayley was the recipient of the degree of LL.D. Professor Bradley was the delegate from the University of California to the King Alfred Millenial celebration at Winchester, England. President Wheeler, Professor Kellogg, and Professor Bacon represented the University at the Yale Bicentenary. The degree of LL.D. was conferred upon President Wheeler.

CHANGES IN INSTRUCTION.

Among noteworthy changes in matters of instruction are the reorganization of the courses in Jurisprudence in such a manner that a student may complete in Berkeley two years instead of one of a legal training; the announcement of new courses in Linguistics by President Wheeler—

for the first term a "General Introduction to the Science of Language," for the second, "Indo-European Grammar;" the introduction of Professor Schilling's courses in Germanic philology, and in the history of German literature; the new course in Cicero and Virgil, covering matriculation ground; Dr. Noyes's courses in Russian; Professor Wilson's irrigation work, and Professor Wells's composition courses; and the important action taken by the Agricultural Department in offering a short course for farmers in the Summer Session, and a special course in practical dairying, from October 9 to December 12.

Thirty-seven students enrolled for the Dairy Course. Under the direction of Instructor Leroy Anderson they engage in practical work in the making of butter and cheese, and in laboratory experiments useful for the creamery or dairy. Lectures are given by Professor Wickson, Professor Jaffa, Mr. Anderson, Dr. Ward, and Mr. Major. In the practical work Mr. Anderson is assisted by J. H. Severin and E. H. Hageman. The best of modern dairy apparatus has been installed in the basement of the Agricultural Building. Later an experimental herd will be purchased, and pastured on the University's hill lands.

FACULTY SOCIETIES.

The Pearson Club has been organized recently by members of the faculty for the discussion of fundamental problems of science suggested by Karl Pearson's "Grammar of Science." The membership of sixteen includes representatives from the departments of Biology, Geology, Mathematics, Philosophy, and Physics. Eight meetings are planned for the year.

A newly organized Philological Club, whose object is to stimulate the production of papers, and to promote comradeship among men of similar tastes and pursuits, will meet on the last Monday evening of each month during the academic year. Active membership is limited to

fellows, readers, assistants, instructors, and assistant professors in the philological departments who will bind themselves to prepare and read one paper during each academic year. Men of the same grades in other departments are eligible to associate membership. Any member of the Academic Council may be elected to honorary membership. Professor William D. Armes is president, Mr. Charles R. Keyes vice-president, and Dr. James T. Allen secretary and treasurer. Papers have been read before the club by Professor Armes on Smollett's Humphrey Clinker as "The Source of Sheridan's 'Rivals,'" by Dr. Allen on "The History of the So-called Iterative Optative in Classical Greek," by Mr. Roger S. Phelps on "The English Blank Verse Line as a Medium for Translating Beowulf," and by Professor L. J. Richardson on "Personal Recollections of Herrmann Grimm."

A committee has been appointed, consisting of Professor Stringham, chairman, and Professors Armes, Lawson, Osterhout, Setchell, Waite, and Mr. Hutchinson, to consider plans for the establishment of a Faculty Club.

LECTURES AND UNIVERSITY EXTENSION.

Caspar René Gregory, Ph.D., D.Th., LL.D., Professor in Theology in the University of Leipzig, and widely known as perhaps the leading authority of the present day on Biblical text criticism, gave six lectures at the University, from September 4 to 10, on "Education and Social Progress in Germany." His subjects were as follows: (1) The German Educational System. (2) The German Student: his Training and his Powers. (3) The Higher Education of Women in Germany. (4) The American Student at a German University. (5) Theology To-day in Germany. (6) Modern Social Movements in Germany.

G. Lowes Dickinson, M.A., Fellow and Lecturer in King's College, Cambridge, and Lecturer at the London School of Economics and Political Science, lectured at the

University from September 11 to 13 on "The White Man's Burden," as follows: (1) The Government of Dependencies. (2) Blacks and Whites: The Problem of Native Races. (3) The South African Crisis. From September 16 to 18 he lectured on "Self-Government in the British Empire," as follows: (1) The English in America. (2) The New Commonwealth. (3) Imperial Federation.

Professor Maxime Kovalevski, Corresponding Member of the Russian Imperial Academy of Sciences, lectured at the University on September 11 and 12 on "The Village Community among the Russian Peasantry."

H. Morse Stephens, M.A. (Oxon.), Professor of Modern European and English History in Cornell University, gave four popular lectures on "English Expansion" for the University in Oakland, from September 10 to 20. His subjects were: (1) Sir Walter Raleigh and Expansion by Settlement. (2) Oliver Cromwell and Expansion by War. (3) Sir Josiah Child and Expansion by Trade. (4) William Pitt, Earl of Chatham, and Expansion by Conquest.

The extension courses offered by the University in San Francisco during the autumn were as follows:

"The German Folksong in its Historical Development," ten lectures, with readings, by Hugo K. Schilling, Ph.D., Professor of German; from September 26 to November 28, in the Y. M. C. A. Auditorium, as follows: (1) The Origin of the Term *Volkslied* and the History of its Definition. (2) The Ballad. (3) The Rhymed Riddle. (4) The Love-song. (5) The Humorous Song. (6) Songs Peculiar to Certain Vocations. (7) The *Volkslied* at its Best, in the Sixteenth Century. (8) The So-called Gesellschaftslied. (9) The Symbolism of the Folksong. (10) The Folksong of the Present Day.

"Art in the Light of the Newer Criticism," seven lectures, illustrated with lantern slides, by Francis Melbourne Greene, B.L.; Tuesday evenings, from September 17 to October 29, in the Y. M. C. A. Auditorium, as follows: (1) The Nature and Scope of Art: a Concrete Exposition.

(2) Form and Color. (3) "Pagan" Art. (4) "Christian" Art. (5) Renaissance Art in Italy. (6) Rembrandt, Hals, Velasquez. (7) Modern Illustration, from 1850 to 1901.

"The Chemistry of Every-day Life," five lectures, illustrated with experiments, by Edward Booth, Ph.B., Instructor in Chemistry; Tuesday afternoons, from September 17 to October 15, at the Mark Hopkins Institute of Art, as follows: (1) Water. (2) Air. (3) Earth. (4) Light. (5) Fire.

"The Literary History of the Old Testament," six lectures by Jacob Voorsanger, D.D., Professor of the Semitic Languages and Literatures, Wednesday evenings, from September 17 to October 23, at the Mark Hopkins Institute of Art and at the Temple Emanu-El, as follows: (1) General Introduction. (2) The Poetry of the Ancient Hebrews. (3) The Prophetical Literature. (4) The Thorah or the Law. (5) (*a*) The Psalms, (*b*) Idyllic Poetry. (6) Job and His Friends.

"The Spectroscope and its Revelations," five lectures by Henry Chalmers Biddle, Ph.D., Instructor in Chemistry, Wednesday afternoons, from October 23 to November 27, at the Mark Hopkins Institute of Art, as follows: (1) The Spectroscope and its Revelations. (2) Revelations Concerning Matter. (3) Revelations Concerning Matter. (4) Revelations Concerning the Sun. (5) Revelations Concerning Other Suns. (6) Revelations Concerning Other Worlds than Ours.

"The History of Physical Training," four lectures, illustrated with lantern slides, by Assistant Professor Magee, Director of Physical Culture, Saturday evenings, from November 2 to 23, in the Y. M. C. A. Auditorium, as follows: (1) Physical Training in Ancient Greece and Rome. (2) Physical Exercises of the Chinese, Physical Training in India, in the Mediaeval Period, and in Ancient Germany. (3) The Principal Features of the Swedish, the German, and the So-called "Delsarte" System. (4) The Development of Physical Training in the United States.

Japanese and Chinese: A class in the Japanese language, conducted by Yoshi Saburo Kuno, M.S., Assistant in Japanese, met on Monday and Friday evenings at 7:15 o'clock, beginning September 16, at the Mark Hopkins Institute of Art. An advanced class met on the same evenings at 8 o'clock. A class in Cantonese, conducted by Walter N. Fong, A.B., Assistant in Chinese, met on Tuesday and Saturday evenings at 7:15 o'clock, beginning September 17, at the Hopkins Institute.

Mr. Richard T. Fisher, of the United States Bureau of Forestry, lectured at the University on October 8 on "Forestry."

David P. Todd, Ph.D., Professor of Astronomy in Amherst College and Director of the Amherst Observatory, lectured before the astronomical students on September 5 on "The Study of Eclipses, and Other Astronomical Problems."

Major N. D. Beach, U. S. A., addressed the senior students of Military Science on October 15 on "Hasty or Battle Entrenchments."

Three of the Bishops in attendance upon the General Convention of the Protestant Episcopal Church in San Francisco addressed the students at Hearst Hall on three Sunday afternoons. The Right Rev. Chauncey Bunce Brewster, D.D., Bishop of Connecticut, spoke on October 6; the Right Rev. Thomas F. Gailor, D.D., S.T.D., Bishop of Tennessee, on October 13, and the Right Rev. William Hobart Hare, D.D., S.T.D., Bishop of South Dakota, on October 20.

UNIVERSITY MEETINGS.

At the University meetings at eleven o'clock every second Friday morning, the faculty and students have gathered in the Gymnasium to the number of from fifteen hundred to twenty-five hundred. There have been one or more speakers at each meeting, the President has presided,

and the student body has contributed college songs and yells.

Instead of speaking to the freshmen alone, as has heretofore been the custom, President Wheeler on August 19 called together the whole University. He welcomed its members back to Berkeley in the following words:

PRESIDENT'S OPENING ADDRESS.

Your college home again opens its doors to you and bids you heartiest, cheeriest, loving welcome,—all of you, women and men, teachers and taught, new-comers and old-comers.

I count it an opportunity worth living for that I can stand here and have a hearing before this vast body of healthy American students who are beginning in all freshness and vigor of hope and zeal a college year. I count it, too, a high and solemn responsibility, and I pray the God of all light and all good sense that I may be spared from saying to you aught that may pervert or mislead, aught that is untrue of fact or untrue of balance, aught that the sound experience of the past does not justify and your experience in the future will not confirm, and that I may be able to say to you some few plain, practical things that may help you a little toward better and more useful living. Each of you has one life to live. The opportunity presented by this particular college year will never be repeated. Misuse it, and it is lost forever, and far worse than lost. You cannot stand still; waste begets waste, gain begets gain. It is a law of the universe: "Unto him that hath shall be given, and from him that hath not shall be taken away even that he hath."

I am well persuaded that every one of you has come here this year with full desire and intent to lay foundations for a successful life-career,—there is no one of suicidal intent among you,—but I am also well persuaded that many of you are blinded to the importance, the overpowering importance, of the right use of this year's opportunity. If you do not

clearly and firmly know, that what you do and what you are this year will play its unerring part in determining what you are to be all through this one life of yours, you are blind to a plain fact of experience. I have found in my experience with college men and women that they are almost without qualification just that in life which they are in college.

Recognizing, therefore, my high responsibility for the words I am to speak, I ask you to give heed to them each according to his individual need and in solemn consciousness of a responsibility to the Giver of all life for the use you shall make of this year and its high opportunity.

A college course may not improperly be regarded as a training for life, but it is far safer to treat it simply as a part of life, as a period of life wherein the habits of thinking, acting, and being which are to be most useful in life are formed through healthful and correct activities in connection with materials and processes such as life is to deal with. All correct activity in life is educative. College people are not the only educated people. Education does not cease with school or college. It is indeed only in so far as college work is *life*, that it educates at all. A false notion is that which makes a college a place where human beings are temporarily isolated from life to the end that they there may ripen and season, like wine in a deep, dark cellar, or pears in a bureau-drawer. So far as the college life removes men from responsibility to the same tests of diligence, punctuality, respect for property, and orderliness that hold in life at large, it is a detriment, and not a help. College students cannot afford to regard themselves as specially privileged members of society or as specials in any sense. If they steal, whether from the inside or the outside of stores, their place is in the common jail.

The supreme test of education is good health, mental health, spiritual health, physical health. The aim of all sound education is to make health abound. Healthy thinking banishes the nightmares of ignorance, super-

stition, prejudice, false perspective. Wisdom is better than knowledge. It presupposes the presence of knowledge, but means health or sanity besides. Spiritual health includes sanity in the moral judgments and sanity in the exercise of our duties toward God. Good physical health is as much a duty as any other, and every one of you should have some daily exercise, whether it be as active as athletic exercise or not. Sitting on the bleachers, it is to be remembered, cannot be counted as athletic exercise.

In the regulation and choice of your college work I doubt not many of you are finding just at this time abundant difficulty, there are so many attractive courses offered, and so few free hours in which to put them.

It has not been my experience that the choice of subjects of study or of individual courses is in any wise so important as students generally think it is. The choice of teachers is vastly more important. In looking back upon their college life I think mature men generally find that the education which has shaped them has had the personal form. I think, furthermore, that I have observed that scholarship of the finest order, inspired, creative scholarship, whenever it emerges, is generally to be accounted for in the training and inspiration obtained from some individual teacher. Some college departments notably produce scholars, others, whose work looks fairer on the surface, do not. Though it is by no means the sole purpose of a college to produce scholars in the technical sense, I should advise a student, even one who does not aim at creative scholarship, to cast in his lot with a department that is producing scholars. He will get something that is not to be got in a department of the other sort. In these things of the higher life, it is quality that counts, and he will get an impression of quality in work that will serve him well as a standard in after-life whatever he does.

One of the best things to acquire in a college course is the habit of doing day's works regularly and punctually as the days bring them around. Prepare every lesson.

Attend every lecture. Go when it rains. Go when you have a headache. Cuts and all allowances of cuts are an abomination. When you get into business, your employers will not allow you cuts. They will not tolerate a man, who, when he faces a duty or is told to do a thing, estimates f r a moment the possibility of choosing whether he will do or will not do. Life has no such easy-going elective system, and colleges ought not to have. Life wants men to do things because they are appointed to do them, because it is their duty to do them, not because they elect to do them.

Avoid taking work, therefore, under an easy-going teacher. It involves too much risk. It relaxes the fibre of duty. The alumni lists of our universities abound in names of gifted men who are failures in life because they have not known the meaning of *must*.

If you find something you do not "take to," I should advise you to *take* it. Do not give up beaten so early in life. Most of the talk about special adaptedness to this study or that is for youths of sixteen or twenty pure nonsense, begotten either of laziness or of an intellectual sluggishness that will ultimately come to reckoning in any market. Men as I have seen them in college classes differ more in force of will than in any mental quality. One of the chief things to aspire to in a college course is force of will. It can be acquired as a habit. It is acquired through the concrete experiences of successful struggles,—mostly against yourself. It is good practice to take yourself diurnally by the nape of the neck and hold yourself out at arm's length, just to be assured you have the right grip. It will afford, too, a good opportunity of looking yourself over. Self-control is the best guarantee of will-power.

In your attitude toward your teachers, start out from the beginning in the unshakable faith that they are your personal friends. That they all are, I can assure you,—to a man. Some of us may appear more approachable than others, but that is a mere matter of manner. We all like nothing better than to know those we teach personally, and it is your

duty to help make it easy for us. Do not make the mistake of going through college without knowing some of your teachers personally and intimately. If you get into trouble go to some one of these teachers and tell it all, precisely as it is. I am greatly mistaken if you do not find then beyond a doubt that you have a friend, and a good one, right in the heart of the faculty. If you cannot do any better, go and see the President.

Do not allow yourself under any circumstances to fall into an attitude of opposition to a teacher. He is here to help you, not to oppose you. He can help you best, if you understand each other fully. Go to him and talk the matter at issue fully over, and do not take the attitude of an attorney for your own case. You may be surprised to find a warmer heart under our shining coats of mail than you dreamed existed. You will never in life find more sympathetic, even indulgent judges than these men who teach you. They all prefer to believe the best things of you, to put the best possible interpretation upon your actions. That is what in practice I find they always do. Their work is all for you. The tests they set you are for your help and for your good. If any one should be so lost to a sense of the relationship between himself and his teacher and so lost besides to his sense of honor as a gentleman, as to cheat,—basely to cheat in an examination,—whom has he deceived? Against whom has he offended? Against his fellow-students who are rated with him under the same test,—that to be sure; but really, after all, his offense, his wrong is against himself. He has defiled his own honor, branded his own conscience, laid upon himself a horrid burden of sin and wrong that he must carry with him through life. In after days the memory of his college course will be stained with the thought of dishonor; the very insignia of his alumnusship, which ought to testify before him to a sacred and noble relationship, will cry out against him as stolen goods, as the emblems of fraud, as the tokens of deceit, as the witnesses to a crime his youth conceived

against himself. And with himself, his tainted self, he must live and commune all these days; the insignia he may hide out of sight, but the dishonor is with him as long as life lasts. He can never respect *himself*. Failing in an examination is a small thing, losing one's degree is a small thing, but it is no small thing if you must sit down, in all the silent hours you have to spend with that self of yours, and look upon it, if you look straight and fair, with scorn,— only with bitter scorn.

I have said enough of this. Only let me admonish you by all that is holy, all that is high, all that is good to make of these college days an experience that shall be a joy and a blessing to your life, an experience which in after days you can recall with clean delight, to which you can recur for help, encouragement, and uplifting. Resolve to banish from your college life all that is low and mean, and make it sacred to the noblest things and the highest ideals.

There is no better thing to be gained from an education than faith in high ideals. An education indeed which does not inspire faith is no education at all. Follow the teachers that inspire and uplift. Shun cynicism and all cynics. Revere noble things. Honor noble men and women. Shut your ears against the words of the detractor and slanderer. Have faith in the right. Be assured it will prevail, for upon it are founded the pillars of the world. Seek unto the highest things. Do not plan to be second-rate. Make all your arrangements to do first-rate work and to be a first-class man. Be patient; plod along; do day's works honestly, alertly, and always first-rately; the results will come. Do not be persuaded to tone down your ideals on the representation that they are too good for the average daily life among men. Beware of the men who advise you to be a little practical, when they mean for you to be a little bad.

OTHER UNIVERSITY MEETINGS.

The speakers at the subsequent University meetings have been as follows: August 30, Professor Hugo K. Schilling

(after Dr. Schilling's address the meeting was resolved into a session of the Associated Students to consider the disturbances at the first freshman meeting); September 13, Professor H. Morse Stephens, Mr. G. Lowes Dickinson, Professor Joseph Marshall Flint; September 27, Professor Charles Mills Gayley and Hon. E. P. Dole, Attorney-General of the Hawaiian Islands; October 11, the Right Rev. Henry Codman Potter, D.D., LL.D., Bishop of New York.

FOREIGN STUDENTS.

The proportion of students who come from without California is increasing. A committee has been appointed by the Regents to consider the advisability of establishing a tuition fee for non-residents. Of the 703 students by September 1 admitted to undergraduate standing, 96, or 13.6 per cent., came from without California, as compared with 53, or 8.1 per cent., for last year, and 28, or 6.2 per cent., for the year 1898.

Eight Chinese students have come to Berkeley to study under the oversight of Dr. John Fryer, Agassiz Professor of Oriental Languages and Literatures. They are the holders of scholarships provided by Sheng, Imperial Minister of Commerce, and Official of the Highest Degree of Rank. All are graduates or former students of the Tientsin University, which has been temporarily suspended because of the Boxer disturbances and the confiscation of the University buildings and site by foreign forces.

Four of these Chinese students will make special studies leading to the work carried on in iron manufacturing establishments. Three are to study law, primarily commercial law, and one is to study mining, with special reference to coal and iron. Practical completeness, and preparation for an active career, are to be the great aims of all. In their leisure time these young men are expected to continue their Chinese studies. All of their affairs are subject to Professor Fryer's direction and control.

Professor Fryer has established Minister Sheng's scholars in a comfortably equipped club-house of their own, hard by his home, and in every way is doing his utmost to further their educational and personal welfare.

Twelve Filipinos are now pursuing their studies in California under President Wheeler's personal care. Four have already been admitted to the University—two as graduate students of civil engineering, one as a student of law, and one as a student of agriculture. The eight others are studying in preparatory schools in expectation of entering the University later.

ALUMNI AS TEACHERS IN THE ORIENT.

Forty-seven graduates or former students of the University are now teaching in the Philippines. All have been appointed upon the nomination or recommendation of the University. The list includes Dr. David P. Barrows, Superintendent of Schools in Manila at a salary of $3,000 a year; Mr. George W. Beattie, who is to be a division superintendent, at $2,250, and the following named, who are teachers of English at salaries ranging from $900 to $1,200 per annum:

Men—Frederick W. Abbott, A. B. Anderson, Louis D. Baun, Benj. G. Bleasdale, George A. Bond, E. E. Christensen, John Gamble, John A. Gammill, Ray Howell, J. A. Mackenzie, Thomas D. Mansfield, Maxwell L. McCollough, Irving Needham, Ernest W. Oliver, Charles E. Putnam, Guy Van Schaick, William C. Spencer, Robert B. Vaile, Ralph Wardell, Howard C. White, Ben F. Wright.

Women—Julia M. Abbott, Agnes Adams, Harriett A. Bowles, Laura L. Donnelly, Josephine M. Dow, Anna Dunlap, Ava Lloy Galpin, Minnie Hopkins, Almira Kelshaw, Clarissa Keyes, Lucile Keyes, Dolores Machado, Gertrude McVenn, Lucy C. Mount, Estella M. Murdoch, Anna J. Neale, Charlotte E. Neale, Lucinda P. Nelson, Mary E. Norton, Euphemia Paxton, Stella M. Price,

Catherine Smith, Margaret C. Thomas, Mrs. Alice M. Farmer.

Five men were sent to Japan by the University last summer to teach English in the Government High Schools of Yamaguchi Prefecture. These men,—Clarence W. Peck, Edward A. Dickson, J. E. Gustafson, Clifton Tracy, and Harold Nock,—are all proving adaptable to their surroundings, and highly successful.

STUDENT POPULATION.

On September 20 there were 2229 students in the colleges at Berkeley, or as many as enrolled during the whole of the preceding academic year. This represents a growth of 227 in a twelvemonth. Of this total, 153 were graduate students and 2076 undergraduates, as compared with 117 and 1885 for the same date last year. The officers of instruction and administration numbered 195.

Seventy-five per cent. of these 2229 students have their college residence in Berkeley, as compared with 51 per cent. in 1894–95, 65 per cent. in 1899–1900, and 71.9 per cent. in 1900–01. Those who cross the bay from San Francisco number 229, from Oakland come 270, from Alameda 36, from San Rafael, Niles, Newark, and other neighboring towns, 19.

The freshmen admitted to regular or limited standing numbered 597 on September 1, as compared with 547 at the same date a year before. Of the freshmen 43 per cent. were women, as compared with 49 per cent. in 1900.

THE ALUMNI.

The Alumni Association has elected officers for the coming year as follows: President, Charles S. Greene, '86, Free Public Library, Oakland (reëlected); First Vice-President, George E. De Golia, '77, 957 Broadway, Oakland; Second Vice-President, W. E. Creed, '98, 328 Boulevard Terrace, Oakland; Secretary, Warren Cheney,

'78, Berkeley; Treasurer, James K. Moffitt, '86, First National Bank, San Francisco (re-elected).

Trustees of the Alumni Association: A. G. Eells, '86, Crocker Building, San Francisco, for 1901–1904; Anson S. Blake, '91, 2231 Piedmont avenue, Berkeley, for 1899–1902; T. A. Perkins, '96, Crocker Building, San Francisco, for 1900–1903.

Board of Administration of the LeConte Memorial Fellowship Fund: W. E. Ritter, '88, 2434 Durant avenue, Berkeley, for 1901–1904 (reëlected); G. M. Stratton, '88, 2747 Channing Way, Berkeley, for 1899–1902; C. S. Greene, '86, Free Public Library, Oakland, ex-officio, for 1901–1902; P. E. Bowles, '82, First National Bank, Oakland, for 1900–1903; Frank Otis, '73, 1609 Santa Clara avenue, Alameda (term to be determined by the Board).

Councilors of the Associated Alumni: W. A. Brewer, '85, St. Matthews School, San Mateo, for 1900–1903; Edward Booth, '77, 1214 Harrison street, Oakland, for the unexpired term, 1900–1903; G. R. Lukens, '89, 212 Sansome street, San Francisco, for 1901–1904; D. E. Collins, '74, 1388 Harrison street, Oakland, for 1901–1904; P. E. Bowles, '82, First National Bank, Oakland, for 1899–1902; George Edwards, '84, 2530 Dwight Way, Berkeley, for 1899–1902; T. A. Perkins, '96, Crocker Building, San Francisco, for 1899–1902; F. H. Dam, '96, 60 Nevada Block, San Francisco, for 1900–1903.

The following deaths among the Alumni have been recorded during the years 1900 and 1901: James E. Keeler, Sc.D., '93, August 12, 1900; M. P. Wiggin, '67, October 18, 1900; John M. Whitworth, '72, April 15, 1901; J. N. E. Wilson, '76, May 27, 1901; M. A. Dorn, '79, October 18, 1900; H. C. Perry, '80, December 1 (?), 1900; Mrs. W. A. Beatty (née Mabel Walcott), '84, April 18, 1901; Charles F. Tay, '91, February 8, 1901; Anna G. Graser, '93, March 11, 1901; Leon M. Solomons, '93, February 2, 1900; Mrs. Chalmers Gunn (née Mary L. Patch), '98, April 20, 1900; George W. Julien, '99, August 23, 1901; Walter

Newman, '99, December, 1900; William H. Hilton, '00, May 27, 1901; W. H. Wentworth, '88, September, 1901; William McKinley, LL.D., 1901, September 14, 1901.

Bernard P. Miller, secretary of the committee of the Alumni which is raising funds for an Alumni Hall, to be the center of the social life of the students, alumni, and faculty, on June 14 reported as follows to the President of the Alumni Association:

"In June of this year a circular letter, signed by the members of the committee, was mailed to every alumnus of the University. This letter set forth the character of the building proposed to be built, and the uses to which it would be put, and also the method by which funds would be raised for its erection. The sum desired is $100,000. Subscribers were asked to contribute to this fund by giving $1 a month, or $1 a quarter, or $1 a year for the period of ten years, or by giving $35 the first year, or $40 in ten years.

"We have had answers to this letter as follows: 90 persons will give $1 a year, aggregating $900; 93, $1 a quarter, aggregating $3720; 8, $1 a month, aggregating $960; 4, $200 cash on demand, aggregating $800; 5, $35 the first year, aggregating $175; 12, $40 in ten years, aggregating $480; 16, odd sums, amounting to $495; total amount pledged, $7530.

"In addition to these responses, letters have been received from prominent alumni pledging themselves to contribute their due proportion as soon as the project is well under way. This much has been done without personal application. It is now proposed (and to each member of the committee separate classes have been assigned for this purpose) that a committee be appointed in each class to canvass the class and to solicit further sums.

"The committee feels greatly encouraged by the number of responses received, and believes that with active assistance in the classes the entire amount solicited will be raised.

"Cash received to date is $206; cash expended, $128.25; cash on hand, $77.25.

the new system of self-government now in force at the University. It is proposed to establish a code of honor to

"The classes that thus far have pledged the largest amounts are as follows: '98, $590; '82, $555, and 1901, $520."

NEW BUILDINGS.

The stonework has been completed of the new President's House, for which ground was broken on Class Day of 1900. This handsome structure of white stone, of the style of the Italian Renaissance, stands on the northern edge of the campus, opposite Scenic avenue. The contracts for the heating and plumbing have been let, and the dwelling will be ready for occupancy by summer.

Ground will be broken next summer for the new Mining Building, which Mrs. Hearst is about to erect as a memorial to Senator Hearst. Mr. John Galen Howard, the architect, and Professor Christy, dean of the College of Mining, visited the chief mining and technical schools of the United States, England, Germany, and France last summer in order to gather material needed for the final elaboration of the plans.

The Hearst Gymnasium has now been fully equipped, and supplied with a large annex containing a furnace-room and baths. It is one of the best-appointed women's gymnasiums in the country. Gymnasium work is now prescribed to all women students for the first year of their residence. The building affords comfortable quarters for the social life of the women students, and is used also for official receptions, concerts, lectures, and important student gatherings.

The University domain, recently much enlarged by the purchase of the Hillegass tract of some thirteen acres, has been rounded out by the acquisition of the Pacific Theological Seminary land, 268 by 184 feet in extent, at the corner of Bancroft way and Barrow street. These purchases leave the way open for any desired building improvements.

STUDENT AFFAIRS.

By W. H. Dorn.

President Wheeler has recently delegated to the student body of the University the power to determine the punishment of students who break the laws of the University; for instance, those who participate in a rush that has been expressly prohibited. The announcement of this change in policy was made on the day preceding the first Freshman meeting of the present term. President Wheeler then placed in the hands of the Associated Students the entire matter of maintaining order at that meeting and of dealing with any disturbances which might occur. Accordingly, when an attempt was made by the Sophomores to break up the Freshman meeting, the Executive Committee, having been empowered by the Associated Students, censured the ringleaders in the disturbance. Hereafter the Executive Committee is to have absolute power in student discipline, even to the extent of suspending or expelling upon sufficient cause.

Pursuant to a suggestion made in a letter printed in the columns of the *Daily Californian*, and to a petition signed by many names, the Associated Students of the University of California met on Friday, September 20th, and authorized the appointment of a committee to confer with the President of the University concerning the establishment of a new method of bringing about fair dealing in examinations. This is intended to be a feature of

discourage and prohibit cheating in examinations and other like offenses on the part of the students. This code of honor shall take the matter of supervising examinations out of the hands of the instructors and place the duty of maintaining order and honest behavior at the examinations in the hands of the student body. The plan has not yet been more definitely formulated. A committee of thirteen prominent Seniors has, however, been appointed by President Eshelman in accordance with the will of the Associated Students as expressed at their meeting. This committee has met twice to consider the proposition of a code of honor, but has not yet come to a decision as to whether or not it is a feasible and practical way of putting a stop to the evil.

Two hundred graduates of the University, a large proportion members of the class of 1901, secured positions as teachers during the summer vacation. This is a larger number than in any preceding year. Of this number over one hundred and fifty will teach on the Pacific Coast, most of them in high school positions, thirty-eight in the Philippines, five in Japan, and five in Honolulu.

The class of 1903 has decided to found a scholarship loan fund to be awarded to an undergraduate student. This fund will not be completely established until about January, 1903. Of the two thousand dollars which it will be necessary to raise in the meantime five hundred was subscribed by members of the class at their last meeting.

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McKINLEY MEMORIAL SERVICES.

On Thursday morning, September 19, the churches and the people of Berkeley united with the University in a memorial meeting in honor of President McKinley.* The addresses on that occasion were made by Benj. Ide Wheeler, President of the University, Rev. C. K. Jenness, pastor of Trinity Methodist Episcopal Church, and Rev. George B. Hatch, pastor of the Berkeley First Congregational Church.

ADDRESS OF PRESIDENT WHEELER.

We are assembled here as members of the richest, freest, most progressive nation that is or ever has been upon the earth, and we are come to mourn the loss of our great father and head, who was the kindliest, the wisest, the most beloved of men. Here by the shores of the Western Sea are we assembled; but up through the mountains, over the plains, down the vast stretches of the valley-land, and along the far eastern shores, in city and hamlet, North and South, East and West, everywhere over the great land, are to-day assembled the fellow-members of our noble bond, blending with ours the voice of their lament. Again has the ardor of a great public grief fused all our loves into one common loyalty; again has the bearing of a common pain blurred the lines of party and creed, section and race, and piled higher that hid treasure of loss which, as a commonwealth beyond the veil, binds us in kinship and unity.

* University CHRONICLE, Vol. IV, No. 4.

Our fields bring forth abundantly, our looms and furnaces hurry to the world's demand, our commerce fills the seas, our marts drop fatness; but it avails us nothing.

Enlightenment abounds; everywhere the shadows of ignorance retreat; in every community the school-house, the library, the church stand open-doored, active to humanize, inform, and uplift; science and its researches are unfettered; the arts of beauty and the arts of use thrive and spread; life grows fuller, richer, sunnier, and, shaking itself ever freer from the dull necessities, rises into scope and outlook; opportunity is free and effort counts, and individual men can shape their fate as never has been in all the days of man. But all this has availed us nothing.

Our government is founded on fullest recognition of the rights of individual man, its authority is exercised according to the law within, more than by the external law of edicts, a free suffrage consults directly the choices of the people, and with an optimism and confidence unparalleled in history makes order the simple expression of the people's will. But this avails us nothing. All of these things have availed nothing. Power, enlightenment, freedom, all of them have not availed to shield our first and best-beloved. The emblems of our wealth and power we robe to-day in sackcloth. Our flag, symbol and guarantee of human rights and level justice, bows its head, and we of the land sit ourselves down beneath it in the dust, a stricken people, overwhelmed in helpless grief; dismayed, confounded, unconsoled.

Of all the men who ever sat in the chair of high authority, none has come nearer to a true understanding of the people's will than this man whose death we mourn to-day; none was more faithful to execute it. The source of his power to know his people must, I think, be identified with his rare endowment of human sympathy. He was naturally and spontaneously interested in his fellow-men, and that singly quite as well as collectively. It was no burden to him to give any plain man a hearing. He attended closely

to what he said, grasped unerringly and almost instinctively his point of view, saw it as he saw it, put himself in his place, felt himself like environed and like circumstanced, saw through his eyes. This was so with every one he met, high and low. He was easy of access; men talked freely with him, because he showed interest in them; he gathered from them not crude information merely, but that priceless thing, the point of view. This is what we mean by human sympathy, and it was through his exquisite and abounding sympathy with men that he came to know the mind of his people, and, finer still, to feel with it its instincts and ideals. Men often chafed at his conservatism and what seemed his slowness in formulating policies or initiating summary action, but again and again the issue has shown that those who counseled haste and were sure to their own satisfaction, and even violently sure of the course to be pursued, conceived their certitude from a vantage-ground that allowed but one of many points of view. Taking many things into account, many things learned through sympathetic communion with many minds,—Mr. McKinley was guided by his peculiar sanity of judgment into courses of action characterized in the most eminent degree by that fine quality we term *wisdom*. His ability to see things as others see them, and accurately to estimate the real conditions under which another holds a certain view, endowed him with rare skill in seeking out a common standing-ground for men and factions of apparently discordant and irreconcilable opinions. The commonest reason why men fail to agree is found in their failure to understand each other, and the peace-making of the peacemaker who can make them understand each other is no small part, though a frequently underestimated part, of the highest statesmanship.

It was again because he could understand them, that men came to have such unbounded personal confidence in him and such love for him. Sympathy is far harder to find in this cold world than bread or shelter, and when men found it, as hundreds and thousands did in this man who

coupled therewith a faith in the noble and the good, they came to do as men must always do, they trusted him, they followed him, they loved him.

So it was that the weight of his influence bore always and everywhere toward the annulling of strife and faction and the establishment of coöperation. He brought unity and accord into the cliques and factions of his party; he replaced the checks and barriers between the different departments of the government with fortunate coöperation born of kindly mutual understanding; and finally, his second administration was rapidly leading toward an erasure of party lines, in that his policies were coming more and more to be the policies of the nation rather than of party. With his last great address delivered at Buffalo just before his death I surely believe he led us to the very door of another "era of good feeling" in which party lines should fade away and party policies blend in national.

He was a friend of man and a friend of men. To no suffering, to no injustice was he indifferent, to no cry of need, to no call for help, to no claim for hearing was he deaf. He spake evil of no man. He showed mercy unto thousands. No hand of a child was ever raised toward him that he did not heed. Toward women he was knightly. His home and his devotion to the companion of his life have set a standard of confirming and purifying influence in the midst of American society.

He is gone from among us. His public acts and policies have passed to their long hearing before the grave tribunal of history. There we leave them. We know he was a man who loved his country, who gave himself unstintingly to its service. We know that under his rule the land prospered, that the nation entered upon larger tasks which opened before it, and gained for itself and the principles upon which it was founded a larger hearing in the courts of the world. But to-day it is the man himself who is in our thought, and we know that in him we and all humanity have lost a friend.

Farewell. Ave atque vale, brave soldier, good citizen, wise magistrate, God-fearing man, kind friend, beloved father of thy people.

ADDRESS BY REV. C. K. JENNESS.

To-day the sound of traffic is low and mourners go about all our streets. We, that blundering, bargaining, frolic-loving people, keep the solemn holiday of mourning around that open grave. Wistfully we gather ourselves together, hoping to find some one who will voice for us the eloquence of our emotion, but our grief is very near and very real, and we have only the few incoherent words of real sorrow.

I remember seeing a picture called "The First Sorrow"—Adam and Eve sitting together, while across their knees lies the body of their murdered son Abel, and the tender Eve droops her head, bowing low in her sorrow, and the strong Adam lays his hand in miserable silence over his heart. And as it was in the beginning, thus it is still among the children of men. Our murdered dead lies in our lap, he who is cut off in the midst of high service, taken from the glory of usefulness, and we sorrow not with the eloquence of words, but with the eloquence of tears.

Many of us here mourn with a double sorrow, for we have lost not only our President, but him whom we call a brother in the service of our God as well. I have been asked to speak of the religious faith and attitude of our dead President. Yesterday, when this request reached me, I was seated with Bishop McCabe, who for forty years has counted William McKinley a personal friend, and who was so moved at the news of his death that he was prostrated, unable to meet his appointments to lecture and preach. And I said to Bishop McCabe; "You knew our President well. Tell me what to say of his religious faith" And the Bishop responded: "I can't tell you what to say, but this I know: The President was a man of prayer; regularly on

Sunday he was to be found at church. He had a special fondness and reverence for the sacrament." In purity and sincerity he partook of the symbols of the Great Sacrifice, and when the assassin's bullet stripped him of all those things which surround a great ruler, and he was simply a dying man, it became manifest in the eyes of all the world that he had been with Him who is meek and lowly in heart. Long ago there was One who prayed as they drove the nails through His hands, "Forgive them, for they know not what they do." To-day we recognize the same spirit in him who as the bullet pierced his body cried out to the angry crowd who would have tramped down his assassin, "Let no one hurt him." Long ago there was One who, taken from the midst of a great work, was yet able, out of agony and wrestling, to say, "Thy will be done." To-day we recognize the same spirit in him who with his ebbing breath whispered, "It is God's way. His will be done." And because he loved his God and served his fellow men, not only with wide patient outlook and strong ability, but also with purity and integrity and humility, the life of William McKinley ranks above that of president or statesman, for he has become one of the saviors of the world, one who, because he is lifted up, draws all men a little nearer to God. He has set every American citizen singing, to-day, "Nearer, my God, to Thee. E'en though it be the cross of death that raiseth me, still all our nation's song shall be, nearer, my God to Thee." To be President is the greatest honor in the gift of the people, but to be a savior is the greatest honor in the gift of God. The life of our President has become a vicarious life; on him who had committed no fault, but rather had rendered good service, was heaped suffering and death.

Those who arraign government and strive to tear down our social organization complain that they are oppressed by the capital which is gained as the result of speculation, that those who govern take advantage for themselves of favored investments. If this is the sin of our strong men, then

William McKinley was spotless, for during his presidency he made no investments. Like the poorest laboring man, he contrived to save a little from his wages. He was guiltless; he suffered not for anything that he had done, but because of the work he had been chosen to do. His vicarious death makes to blaze before the eyes of all the people the exceeding sinfulness of sin on the one hand, and on the other hand, the exceeding beauty of forgiveness, the exceeding worth of purity, the exceeding glory of the service of God. The open grave calls to us to put far from us not only falsehood and vice, but to put away from among us bitterness and envy and criticism, for these things we now see to be sins, polluted sources which have brought forth death. That open grave exalts in our eyes the elements of all good character, faithfulness, integrity, forgiveness and tenderness, and, watered by the tears which fall round our President's grave, is growing the inspiration to better manhood, more spotless service, more whole-souled loyalty to our country. Thus shall this death by sin lift the nation a little nearer the attainment of the life of righteousness.

"Blessed are the dead who die in the Lord. They rest from their labors, and their works are following on after them. And God shall wipe away all tears from their eyes; and there shall be no more death, neither sorrow, nor crying, neither shall there be any more pain; for the former things are passed away."

ADDRESS BY REV. GEORGE B. HATCH.

Because he was our President, we ought to mourn for him; our whole land ought to bow down in unfeigned grief. Emma Goldman is reported to have said that for the human being, McKinley, she felt some human sympathy; but that for the ruler McKinley she had no sympathy and felt no sorrow: that was the infamous utterance of infamous

anarchy. Some of our newspapers, since he became President, have spared no invention that skilled and keen malignity could devise to cast derision upon him as our President and to cause him to appear contemptible in the eyes of the people: such action has been and ever is the infamous action of infamous anarchy.

Against this anarchy I wish here to-day to cry the protest of every righteous and right-seeing citizen. If our people do not know, it is high time that they learned, that there is a divinity which doth hedge a President of this United States.

The elementary principles of citizenship and patriotism are these two: (1) Fear God; (2) Honor the King; or, as Jesus said: "Render unto Caesar the things that are Caesar's; and unto God the things that are God's." Any one, therefore, who is lacking in either of these two principles is so far forth lacking in his patriotism and citizenship; and any force or voice which militates against these two principles is so far forth the force and the voice of anarchy.

Fear God: this is the first and paramount duty of the citizen. *Honor the King; render to Caesar the things that are Caesar's:* this is the second sacred duty of the citizen. The question is not who or what the man is who is our President; the question is not whether he is of our party or of our policy; whether we voted for him, or against him, or withheld our vote; whether we believe in his wisdom and righteousness, or do not believe in them; our President is still our President, whether by our choice or against our choice; and if there is any righteousness in us or any patriotism in us, we shall honor him and pray for him and do our best to love him as our President, so long as he holds that high and sacred place.

I speak against that accursed and licentious spirit which reverences no authority and which acknowledges itself subject to the majesty of no government, but obeys its own self-will. One great lesson which this nation needs to

learn is the lesson that the person, the name, the majesty of its President is sacred—sacred as the flag itself, whose folds at sunset may not touch the deck of our ships as it is hauled down, and whose authority every soldier and sailor must salute—sacred as are the principles of liberty which our fathers won, which our Constitution preserves, and which our President represents. If any man speak a word or lift a finger to fling contempt upon the flag, how swift and hot our anger against him is! If any man or any spirit speak a word, or lift a finger, or print a paper, against the honor and the majesty of our President, our anger should be just as swift and hot; our throats should cry against him, "Let him be anathema!" We should thrust him into the outer darkness whence he came and where he belongs.

For the one reason that our President has been shot; that the sacred majesty of this republic has been dishonored and violated; that the holy of holies of our national temple has been entered and defiled: for this reason above all others, we ought to bow down our souls in sorrow to-day; yet not in the sorrow which brings forth no fruit, but in that sorrow which shall work in our own hearts the righteousness of a purer patriotism and a finer citizenship, and which shall cause the land to be purified of its sins.

He who was our President lies dead. We mourn for him because he was our President; we mourn for him also because he was a good man and a good President.

I am not concerned to say that he was a great man and a great President measured by common standards. Perhaps he was. I think he was. I believe that in the verdict of history he will be found written as one of our greatest men and greatest Presidents, measured by the usual standard. But with that I am not concerned; for that I do not care. In the judgment of truth, it is a small matter indeed, whether, measured by common standards, a man is great or small; for in the judgment of truth the question is whether a man is good, and what the character of his deeds

is, whether good or bad. We mourn our President, because he was a good President and a good man.

There is a standard of greatness with which alone it is worth our while to measure: it is the standard of the Word of Truth; it is this: "He that humbleth himself as this little child, the same is greatest in the Kingdom of Heaven;" and, "He that would be great among you, let him become last of all and servant of all."

No man, whatever his position and achievements, is in any true sense a great man, who does not measure up to this standard of the word of Truth, and is not first of all "humble as a little child," and after that, in his estimation of his office among men, "last of all and servant of all." In the measurement of truth there is one standard for greatness and for goodness; and he who is great is good, and he who is good is so far forth great.

This was the greatness of Abraham Lincoln. This is why Lincoln's name grows more lustrous with the passing years. Very typically, more typically perhaps than any other of our first Americans, he humbled himself as a little child, he accounted himself the servant of all.

This was, though perhaps in a less degree, the greatness of James A. Garfield; or if we want an instance near to hand and warm in all our hearts, it was the greatness of Joseph LeConte.

It is also the greatness of William McKinley. Very conspicuously, very consistently, he showed that spirit of humility, that spirit of service, which together constitute and produce the greatness which passes the judgment of truth, and which blesses and upbuilds the earth. I have revised some of the thoughts I once had concerning his "imperialism," and I now believe that the "imperialism" which was dear to the heart of William McKinley and which he desired for this nation, was the "imperialism" of service, the "imperialism" of doing good. His last speech breathed that spirit, was instinct with that desire; and if our nation can become "imperialistic" according to the

spirit and tenor of that speech, she will be an empress from whose hands good will fall to the remotest barbarian of the earth, and the very hem of whose garment will help to heal the evil of the world.

We mourn to-day a President, a man, great in his goodness; great in his tenderness toward the woman whom God gave him to wife; great in his love of democracy and simplicity; great in the breadth and sincerity of his desires that he and his country might serve humanity and liberty and civilization to the uttermost parts of the earth. And because we mourn for so good a man, therefore there is joy and exultation in our mourning: we are proud of him for whom we mourn; we are sure that his work shall follow him; and that it is of such as him the words were said: "They shall never perish; neither shall any be able to pluck them from my Father's hand."

Lincoln said at Gettysburg: "The dead have done their part; it is for us, the living, to do our part."

The dead have done their part. Except for the deeds of those who are dead, we should have no country, no church, no civilization. The ground on which we tread is level and holy, because its valleys have been filled and its rough places have been made plain by the sacred dust of those who have been this way and who have laid down their lives for us to walk upon. The unfinished fabric of our civilization is builded upon the foundation of the apostles and the prophets, Jesus Christ Himself being the chief corner-stone; and every separate stone, elect and precious, which has gone into the rising walls of this temple, has been some good man or woman, some doer of righteous deeds, who now is dead. To this fabric, another living stone, the head-stone of a conspicuous corner, has now been added; and the character and deeds of William McKinley have made and will continue making their contribution to the strength and the beauty of freedom's sanctuary. He has done his part.

It is for us, the living, to do our part. Let us adopt

the creed of President Roosevelt, and be doers of the word, not hearers only, deceiving our own selves. The *Outlook* says that President Roosevelt's creed, as expressed in his Minneapolis speech, is "heroic"; and seems to intimate that it is a creed too high for ordinary men. Very well; then let us not be ordinary men any more: but if to suffer our full share of the labor, the sacrifice, the sweat, the dirt, involved in doing the deeds of righteousness and of conscientious citizenship be "heroic," then, in the name of that cross which every true man must daily bear, let us be "heroic." Let us lay down our lives, as others have done, to furnish new and higher ground for the coming generations to walk upon. Let us build ourselves into the fabric of civilization, into the beauty and the strength of freedom's sanctuary; not caring whether our place therein be conspicuous or inconspicuous; caring only that we contribute our full share, little or much, to its beauty and to its strength.

If we, the living, dedicate ourselves "to the great task remaining before us," not loving our lives but even hating them for the sake of that which is worth loving, then "the great task," which has "thus far been so nobly carried on," will not suffer in our hands.

THE NINTH JUBILEE OF THE UNIVERSITY OF GLASGOW.

By Charles Mills Gayley.

The fifteenth century, though mostly occupied with treasons, strifes, and sudden deaths, snatched leisure once in a way for penance; and this perhaps helps to account for the fact that during the century no fewer than twenty universities were founded on the continent and three in Scotland. Of the latter, one was the University of Glasgow. In 1451 Pope Nicholas the Fifth issued a bull for the erection of a *studium generale* in Scotland; and the little town of Glasgow, then a fishing village clustered around a cathedral, was chosen for the new university "by reason of the healthiness of its climate, the plenty of victuals and of everything needful for the use of man." The victuals and the needfuls (by which latter must be meant the wee snacks of the "water of life") are still "plenty," and so is the climate, but for its quality the present writer cannot say much.

The course in the new university was modeled upon that of Bologna; and with all the privileges of the older the younger was endowed; but with nothing else, for, as the historian declares, "it came into the world as naked as any individual." We find, in the *Liber Saecularis Glasguensium*, that, at first, the college was installed in an old building in the Rotten Row—the ruins of which, known as the "auld pedagogy", were still to be seen in the last century. "Nine years afterwards Lord Hamilton bequeathed to it four acres of land in Dovehill and a tenement in the

street leading down from the cathedral to the Market Cross, near the Place of the Dominican Friars. There, on what became the High Street, where a new College was to be built, the masters and students took up their quarters. In recompense for this pious gift the donor required that twice a day, after meals, the masters and students should rise and pray for his soul, and for that of his spouse, Euphemia; for in those days pious founders who lent to the Lord exacted very high interest. The College held its convocation in the cathedral";—the stately old St. Mungo's of to-day—"and meetings of the students in the dark crypt at the altar of St. Nicholas, where they chose a rector by a majority of 'nations.' For as the great European universities divided students into 'nations,' since scholars came from many countries to study, so did this poor *pedagogium*, though the 'nations' were only students from different districts of Scotland. . . . .

"Then came the Reformation; away fled Popish churchmen, students, and masters, and when we see the august University once more all that is left of it are twelve individuals: a principal, three regents, four poor students, the principal's servant, an *oeconomus*, a cook, and a janitor. To such a miserable remnant are the functions and privileges left, with a meagre revenue of £25 yearly. From St. Andrews in 1574 came that stalwart reformer and universal scholar, Andrew Melville, who had lectured at Paris, Poictiers, and Geneva, and he constituted the whole teaching staff in himself, lecturing on Greek (when very few protestant clergy in Scotland could read the New Testament in the original), on Hebrew, Chaldee, Syriac, prelecting on scholastic philosophy, on physics, on logic, rhetoric, chirology—in a course which lasted for six years. . .

"The College life went on the same throughout the 17th century, whether presbytery or prelacy had the upper hand. Accommodation was hard to get in the little town, and the University was anxious to keep a close superintendence over the youths lest any moral evil befall

them. It was, therefore, in chambers within the College that they sought to lodge as many as possible. When the scholar arrived there was given to him the key of his chamber, the accommodation of which was small and its furnishings severely scanty. In a room where four lads were to lodge, there would be two standing beds, a table, four desks or 'studies' with shelves for their books and hard forms for their persons; for all of which there was charged for the session from eight shillings to half-a-crown according to situation on the turnpike stairs. The Faculty being intensely nervous about the safety of the garnishing they gave, a careful inventory was written, and solemn compact made with the occupants to keep their valuable fabric and goods without detriment. Here is a specimen of these curious documents: 'We under-subscryvours, having received the key of chamber 5, plenished with thrie standing beds, thrie studies—the one in the east corner with shelfs, a tabel and a furme, another at the back window with a table and fixed furme and a shelfs, and the thyrd at the fire with a table, a furme and shelfs: a broken loek and key on the first study, with sufficient loekes and kies to the other tuo, a coll house with a broken door, a chimney with whole windows, and ane sufficient lock upon the same chamber door—Doe oblige ourselves to keep the chamber in good care as at this tyme.' (Here follow the numbers of the five under-subscribers.) Should any wilful damage be done, the person 'delated and found guiltie of breaking the glass windows or other detriment' was publicly and ignominiously whipped and extruded from the College. Such was the law since 1667.

"Keys these scholars had, but no privacy, for the most vigilant watch was kept over all their words and doings—not merely by the censor appointed out of their number, who might, or might not, inform the authorities—but by the regent whose charge it was for the week to visit the apartments. At nine o'eloek his cautious footsteps were heard creaking up the turnpike stair; he turned the key to

discover if all were behaving themselves seemly—no cards, dice, no play books; he inquired if they had been careful in secret prayer, for by regulation 'he was to discover what conscience each made of secret devotions morning and evening.' Thereafter, blowing out the tallow candles, he took his departure. At five o'clock next morning the steps of the Hebdomadar—as he was called—again mounted the stairs, to waken the lads and see that all were soberly behaving; and at six o'clock they were summoned by the College bell, which was 'ting-ed' or 'pulsit'—signal for all to meet in the common hall for prayers and praise and reading of Scripture, by the glimmering of candles in cold, dark winter dawn. With empty stomachs the lads went to the classes, listened to the prelections, always in Latin, in which the Regent lectured on Greek or physics or philosophy, till nine o'clock, when again the bell was 'ting-ed' or 'pulsit,' and they flocked into the hall for breakfast. At the upper table sat Principal and Regents in their gowns; at other tables were the divinity students or 'theologues,' and the art students, vaguely called 'philosophers.' At the chief board there was set down a "sup" or soup, of fine wheat bread, and also dry bread and ale; or, on three days of the week, 'fresh caller eggs' and fresh butter. Meanwhile the boarders partook of a soup of oat loaf, 'good and sufficient,' of one lb. weight, to be divided amongst three, with bread and drink; on other three days they had one egg each. At 12 o'clock the bell sounded for dinner, and hungrily they sat down once more. If it be on 'flesh days'—Sunday, Monday, Tuesday and Thursday, the masters had their broth, or skink—a succulent soup made of cow's hams—sodden beef, roast mutton, with wheat bread and 'good stale ale'; which is varied on 'fish days' by kail, a herring, two courses of fish, and a roast of flesh. The boarders, in their turn, dined, on 'flesh days,' on an oat loaf divided into two, a 'taylie,' or lump of beef 'sufficient for four,' which all shared from the same wooden platter and cut up with their own clasp-

knives, but on 'fish days' they luxuriated exceedingly on two eggs and a herring. It is evident that their stomachs were not gorged, neither were their palates pampered.

"When classes ended, at five o'clock, they might go where they pleased, but out of the College they must not pass bearing sword or dagger, for there had been quarrels and assaults, and even murder, which brought grief and scandal on the College. Not a word but Latin must be spoken within the College precincts, not even in play, and to secure obedience to this rule, as well as to that against profane oaths, 'clandestine captors' or censors were chosen out of the 'poorest students,' as most likely to have least dignity or scruples in spying on their comrades; and on the report that any had spoken Scots the offender was to be mulcted of 6d. Scots for every transgression.

"At length supper hour arrived, and once more there was the scramble of scarlet gowns into the hall, The masters were regaled with broth, or skink, roast mutton and a hen; or, on a 'fish day,' they had 'stamped kail,' eggs, some roast flesh and stewed plumdamas—that is damascene plums or damsons,—at all which the Bursars must have looked with envy, as they took their humble fare of 'soppes,' and bread and milk, or a dish of fish 'enough for four,' eaten from one platter, and with the fingers, as no forks were used. Such was the fare, dismally monotonous, far from sumptuous, which was laid in the College Hall."

So much for the animal, now for the intellectual man. "The class-rooms were small and very dark in the dreary winter mornings, with the light of guttering tallow candles. The class was opened with prayer, not by the regent, but by the students, who on successive mornings took their turns. When a youth began to flounder agonisedly in precatory Latin, there was delight unbounded amongst his classmates, and there was pleasing emotion when it fell to the lot of some scapegrace [to agonize]—whose varied accomplishments did not include 'wrestling' in prayer. In

the beginning of the next century the scandal was felt too much, and only sober-minded students were called upon. The regent took his pupils right through the curriculum from the 'bajan' class on to the final or magistrand class, prelecting through three or four years on Greek or mathematics (when there was no special professor for these subjects), on logic, moral philosophy, pneumatics (which included the nature of spirits, angels, and deity), and natural philosophy—aided by very poor apparatus, of which the University was very proud,—a double-barrel pump and a telescope in the highest state of inefficiency. The class-room rang monotonously with the names of Aristotle and Porphyry, or Burgerdicius and Ramus, of Vossius and Puffendorf. This multifarious course took a great deal out of the professor, but put extremely little into the students, and it was a boon both to teacher and scholar when the preposterous system was abolished in 1726 and a special professor was assigned to each branch."

I have quoted thus at length from the *Liber Saecularis* because it will soon be out of print, and Chorley's account which is here embodied is inaccessible to Americans.

The most important events in the history of the University since the arrival of Andrew Melville in 1574 were: first, the *nova erectio* in 1577, by which James the Sixth prescribed proper rules with regard to the college and made a considerable addition to its funds; second, the removal of the University from the old buildings in High street to the magnificent site on Gilmorehill. In these new buildings the classes of the University met for the first time in 1870–71. There is, I imagine, no finer university location in Great Britain than that enjoyed by the University of Glasgow. The little fishing town of the fifteenth century has now grown to be the second city in Great Britain, with a population of almost a million inhabitants; and the University has grown proportionally. Situated as it is in close, but not too close, proximity to the central marts of

Scotland, it has just such advantages as are most desirable for a seat of learning from which have proceeded, and must proceed, so many of the capitalists and law-givers of the Scottish race.

The University is governed in a much more democratic fashion than our American universities. All graduates of the University have a a voice, directly or indirectly, in the management, and the undergraduates enjoy the privilege of electing the chairman of the University Court, or Board of Regents, as we should call it. Through this officer, the Rector, at present the Earl of Rosebery, the undergraduates have a voice in the management of University revenues, the election and removal of instructors, and the fixing of fees. The Court has, however, nothing to do, except as a Board of Final Appeal, with the arrangements of courses in the University; these are determined by the University Senate, which is presided over by the Principal, whom we should call President, of the University. The formal head of the University is still another functionary, known as Chancellor (now the Earl of Stair), but the Principal, as Vice-Chancellor, discharges most of his few duties.

The students pay a small matriculation fee and a fee equivalent to about fifteen dollars a term for each course elected. Some of these costs may be canceled by means of the income derived from scholarships, but scholarships in Scotch universities have so far not been distributed in the manner of charity, as in some of our American institutions, but as a reward for superior answering in examinations upon entrance or during the academic course. There was, for a time, apprehension lest Andrew Carnegie's recent benefaction of $500,000 a year to the four Scotch universities might tend to "pauperize" education, but Mr. Carnegie speedily allayed the alarm by placing his scholarships upon such a basis as would ensure their being earned by the students who enjoyed them.

The University is divided into five distinct faculties,—those of Art, Science, Medicine, Law, and Divinity. The

students fall into two bodies,—the Togati, or regular undergraduates in the academic course, and the Non-Togati, or special and professional students. Members of the former body are entitled to wear the ancient academical robe of the University—a scarlet cloak. Women have been admitted since 1892, but they are allowed to hear lectures in the same class-rooms with men only in the honors courses and the courses in political economy, education, and history. On what grounds (other than the personal preference of professors) this distinction is made, I have been unable to discover. The students have a Representative Council, which bears a close resemblance to our organization of the Associated Students. The academic population of the University is at the present time of about the same size as that of the University of California. The course of study is shorter than ours. It covers only five or six months in the year, may be completed in three years, and leads to the degree of Master of Arts. But it must be remembered that most Freshmen of the University of Glasgow are better disciplined in the classics and the modern languages on entrance than are the students entering our state universities, whose scholarship is generally characterized by a smattering of but one subject or an ignorance of both.

The four hundred and fiftieth anniversary of an institution of learning, beside the antiquity of which the years of our most venerable American universities are as childhood, would naturally call together a great number of visitors from institutions of art and science all over the world. On the 12th of June, 1901, some six hundred delegates gathered in Glasgow to honor the University. There were representatives from forty-seven American universities and learned societies, representatives also from the universities of Great Britain, of the continent, from Japan, from the British colonies, from Hindustan,—in fact, from every quarter of the globe. The Glasguensians had made careful provision for their guests and for an excellent series of entertainments: openings of new buildings, conversaziones, garden

parties, evening receptions, banquets, glorious Scotch dances with Highland bagpipes piping, students' torch-light processions, and all such promoters of conviviality. But most impressive were the commemorative service which opened the Jubilee, the presentation of addresses of congratulation, and the conferring of degrees. The commemoration took place in St. Mungo's,—where John Knox had often preached and where Cromwell in his pride had once been rebuked,—and, as the richly robed procession filed into the ancient cathedral and up the aisles, a concourse representative of many fields and of institutions widely separate but pursuing one truth, no man can have looked on without a thrill. The service was gorgeous. Though it was Presbyterian and strictly Genevan, dignitaries of the Anglican church shared in the offices with dignitaries of the established church of Scotland. In the chancel sat the Principal; before him lay the mace that Beaton had carried to France when in 1560 he fled from the Reformation; on either side the stalls were occupied by the Principal of Aberdeen, the Bishop of Ripon, the King's Chaplain and Minister of St. Mungo's and other clergymen. Among the distinguished men who filled the benches were Sir Ian Hamilton, General Sir Archibald Hunter, Lord Balfour of Burleigh, Earl Beauchamp, the aged Marquis of Dufferin, the Earl of Glasgow, Sir Archibald Geikie, the President of the Institute of France,—le Comte de Franqueville,—Andrew Carnegie, Sir James Reid, Sir Henry Roscoe, Professors Jackson and Mayor of Cambridge, Pelham, York Powell, and Provost Monro of Oxford; of our own professors the best known were, probably, President Adams of Wisconsin, Baldwin of Princeton, Seymour of Yale, and Farlow of Harvard. Most of these men were "capped" upon the succeeding day.

One can hardly appreciate what a University as old as Glasgow stands for unless one calls to mind some of the events that have marked the world's history since its establishment. And this the preacher of St. Mungo's on that

interesting morning last June asked us to do. I cannot remember all the happenings with which the Reverend Macadam Muir illustrated the antiquity of his University, but I remember well the skill with which he directed our attention to them, and the sentiment of respect for his Alma Mater which was thus awakened. In 1451, when Glasgow University was founded, Constantinople was not yet captured nor the Mazarin Bible yet printed; England was still exercising its nerves over Jack Cade; James II was on the throne of Scotland, and the Ballads of Chevy Chase and Otterbourne were just getting themselves sung. When, in 1501, Glasgow was passing her first milestone of fifty years, the Cape had only recently been rounded. Columbus had within the decade made his great discovery: in Florence they were burning Savonarola, and they were founding St. Peter's in Rome. Just two years later James IV was riding into Edinburgh with Margaret Tudor on the pillion at his back, and Dunbar was singing the nuptials of the Thistle and the Rose. When 1551, the year of Glasgow's second jubilee, was come, Luther's work was done, Calvin was still alive, the Reformation had triumphed in England and Knox was carrying it to a safe conclusion north of the Tweed. By the time of the third jubilee Presbyterianism had been established in Scotland, Mary Queen of Scots had perished and James VI was on the throne; Queen Bess was stepping to her grave; Marlowe and Lyly had come and gone, Shakespeare, in his prime, was writing *Hamlet*, and Ben Jonson was beginning; Raleigh had planted his colony in Virginia, and the Pilgrim Fathers were casting about for a home where political and religious freedom might be enjoyed. When the fourth period of jubilee was accomplished the Stuarts had reached their climax in England; Dunbar and Worcester had been fought. It was Cromwell's day and Milton's. The New England colonies were growing apace, and the oldest of American universities was thirteen years of age. When Glasgow's fifth year of jubilee arrived, the English Revo-

lution had already taken place, the Scottish dynasty had lost its second chance and the Union of the Kingdoms was at hand. Before the sixth milestone had been passed, Culloden and Preston-pans were fought and the Jacobites silenced. In the America and India of 1751 the French and English yet strove for colonial empire. In Europe Frederick the Great was catching breath between Hohenfriedberg and Lobositz; Kant and Hume, Rousseau and Voltaire were changing the intellectual attitude of country and of school. At the University of Glasgow Adam Smith was teaching, Hutchinson had recently died, and Cullen was lecturing in Chemistry, By the date of the seventh jubilee, Robert Burns had sung and ceased, and his mantle had fallen to Scott; the American Commonwealth had taken its place among the nations of the earth; France had burst into revolution, and Napoleon was First Consul; Nelson had won his victories; so had Clive and Hastings; Seringapatam had fallen, and at the feet of England lay Hindustan. In Glasgow thought grew apace: Reid had succeded Adam Smith, and Black had added to the glories of Cullen's chair. During this seventh period Coleridge and Wordsworth were commencing; the latter had just passed away when the four hundredth year of Glasgow University was celebrated. For the two years just preceding the Rector of the University had been T. B. Macaulay. Sir William Hooker was now widening the bounds of botanical scholarship, and the present Lord Kelvin those of physics. Ramsay was teaching the classes in Humanity; and the day was at hand when the brothers Caird should lend new distinction to the chairs of Divinity and Moral Philosophy. In England, meanwhile, the reign of Victoria was well begun, the interests of international commerce had found expression in the First Great Exhibition, Tennyson was poet laureate, Carlyle was "sermoning," and Thackeray and Dickens were "humoring" the times.

Somewhat thus it was that the University preacher at the opening of the ninth jubilee led us to consider the tracts

of time traversed in the career of Glasgow. Similarly, by the address of the stately Principal and Vice-Chancellor, Dr. Story, and by the time-honored functions that attended the conferring of degrees, one was continually reminded of the touch of the present with a tremendous and still living past. Such occasions refresh the historic sense. Oxford and Cambridge and St. Andrews may, by a saeculum or so, be the elder sisters of Glasgow. Each is graced with historic honors, and, in turn, honored by her children; but none can point to a progeny more useful to the world of learning, conduct, and science than that which has proceeded from the college by the Clyde:—in Theology, practical as well as speculative, Elphinstone, John Major, Melville and Spottiswood, John Knox, the Beatons (Cardinal and Archbishop), Norman Macleod, and the late Archbishop of Canterbury, Archibald Tait; in literature, Henryson, Campbell, Smollet, Boswell, Jeffrey, Lockhart, Pollok, Tom Taylor, John Nichol, Andrew Lang, and many another; in Philosophy, Hutcheson, Reid, Sir William Hamilton, John Caird (the late Principal), and Edward Caird (now Master of Balliol); in the classics, such giants as Buchanan, Ramsay, and Sir Richard Jebb; in Political Economy, Adam Smith; in Science, pure and applied, men like Simson and Maclaurin, the mathematicians, Allen Thomson, Rankine, the father of modern engineering,—Cullen, Black, and Hunter, James Watt and Lord Kelvin; in Medicine, Lord Lister, Sir Hector Cameron, Sir William Gairdner, and William Macewen. It has, in fact, been recently said, with some exaggeration, but still with fair reason, that from the days when Thomas Reid and Adam Smith were professors of Philosophy, every Scotch thinker of eminence, with the exceptions of Hume and Ferrier, has either studied or taught at Glasgow. Glasgow has also its Livingstones of commerce, and of conduct, of administration, and of learning, as well as of travel. No wonder that when an institution like this makes ready to celebrate its flower of four hundred and fifty years, the world is willing to assist.

THE YALE BICENTENNIAL CELEBRATION.

By Thomas R. Bacon.

The University of California was represented at the Yale Bicentennial Celebration by three delegates. It has therefore seemed proper that some report of the proceedings on that occasion should appear in these pages, and I have been asked to make it. I find it a difficult thing to do, for any adequate description of what took place would fill more space than could be spared. Further, the functions were so numerous and varied, that it would be hard for any one to do justice to them all. The exercises began on Sunday morning with an appropriate sermon in Battell Chapel, and closed late on Wednesday with a general reception to the graduates and visitors. The hours between were full. No judicious person attempted to be present at all of them, but selected beforehand the particular events which it seemed to him he would be best pleased with, and then spent much bitter regret over the fact that he had not been present at the others.

It may be remarked, as a sort of preliminary, that the conduct and administration of affairs was perfect. Every part of the program was carried out with the precision of clock-work, a fact which implied an enormous amount of hard work and foresight on the part of some one. Further, the arrangements for the entertainment of guests and graduates were absolutely complete, and if any one failed to obtain accommodations, it was his own fault.

It is difficult to pick out from so large a number of

events those which are most worthy of notice. It certainly seemed to me that those which made the most impression upon the visiting delegates, who were not particularly well acquainted with the life of Yale, were those which were wholly arranged and carried out by the students and graduates themselves, such as the torch-light procession and the spectacular exhibition on the campus on Tuesday evening. This impression I derived from such visitors in conversation. They seemed somehow to have caught some small glimpse of that "Yale spirit," of which they had heard so much, but in which they scarcely believed.

A report like this, however, should properly concern itself with matters which to many persons seem more serious than torch-light processions and football games. These are probably to be found in the remarkable series of addresses by distinguished men, which ran through three days, and in the culminating Commemoration Exercises in the Hyperion Theater on Wednesday morning. The addresses were delivered in the Battell Chapel, and were as follows: "Yale in its Relation to Christian Theology and Missions," by Professor George P. Fisher; "Yale in its Relation to Law," by Mr. Thomas Thacher; "Yale in its Relation to Medicine," by Dr. William H. Welch; "Yale in its Relation to the Development of the Country," by President Cyrus Northrup, and "Yale in its Relation to Science and Letters," by President Daniel C. Gilman. The names of the speakers are enough to have made certain the excellence of the addresses, and each seemed to rise to the inspiration of a great occasion.

There was only one drawback to the exercises of Wednesday morning, and that was in the utter inadequacy of the theatre for the accommodation of even those who had a right to be present. If the great University Auditorium, now in process of erection, had been complete, it would not have been large enough, and the largest theater in New Haven was altogether insufficient. None of the classes later than '84 got inside the doors, and, of course, the

undergraduates had no chance at all. They all took part in the august academic procession from Dwight Hall to the theater, a very impressive spectacle. At its head walked the President of the United States and the President of the University, the Governor of the State and the ex-President of the University, and behind them walked more men of high distinction than were ever brought together on such an occasion in the history of the country.

These same men served in themselves to make illustrious the assembly in the theater, and to set off the dignity and splendor of the occasion. The exercises consisted of a poem by Mr. E. C. Stedman, the singing of a Greek ode, an oration by Mr. Justice Brewer of the Supreme Court, and the conferring of the honorary degrees. Everything was excellent of its kind. Perhaps the greatest surprise of the occasion was the Greek ode, written by Professor Goodell and set to music by Professor Parker. Those who know about such things say that the ode is a good ode, and musical critics say that the music is good, but these things might be so and yet the whole thing miss making much impression on the audience. The audience is apt to regard music on such an occasion as a sort of interruption, or recess, in the course of the proceedings. Such was not the case here, and no part of the program made a profounder impression or was listened to with more breathless attention than this.

The interest culminated in the conferring of the honorary degrees. This would necessarily be so, owing to the distinction of the men who received them. But the interest was greatly increased by the method. The President of the University, following precedent, gave briefly the reason why each degree was conferred, and these characterizations of the candidates were so terse and sparkling that dead silence fell on the applauding audience every time the President opened his mouth, and, as he had sixty-one degrees to confer, the whole seemed a surprising feat to those who did not know him.

It is well to say something of the music which came into the program, and which contributed so largely to the success of the celebration. There was hardly a single meeting of which music did not make some part, were it only the singing of a hymn or a college song. And all this music was excellent in its own way. The more formal musical performances were an organ recital in the Battell Chapel on Sunday, Professor Parker's *Hora Novissima* on Tuesday, the Greek ode already mentioned, and a concert by the Boston Symphony Orchestra on Wednesday. This last was the graceful contribution to a Yale celebration by Mr. Henry L. Higginson, a member of the Corporation of Harvard University. But a mere citation of such examples fails to give any adequate notion of the "music in the air," which gave a distinct flavor to the whole celebration. The most amusing illustration of the prevailing harmony was found in the eagerness of the mass of graduates to teach accomplished musicians how a tune ought to be played. The fun was that the graduates were right.

There are two more or less permanent memorials of the celebration. One of them is found in the erection of the "Bicentennial buildings." This architectural group was not complete at the time of the celebration, because of the wise determination of the Corporation that no building should be begun until there was enough money to finish it. The necessary funds for the completion of the group were not in hand until last Commencement day. Yale asked for two millions of dollars and got it. These buildings are four in number: the dining-room, University Hall; the administration building, Woodbridge Hall; the auditorium, Woolsey Hall, and the memorial portico, the entrance to the dining-room and the auditorium, where shall be inscribed the names of those whom their Alma Mater delights to honor. Much criticism was called forth on the publication of the designs of these buildings, because they departed so far from the prevalent "collegiate Gothic" of comparatively older buildings. When the bitterest of the critics

saw the result, so far as it went, he had to admit that it was not as bad as he expected. The fact is that a range of buildings, covering three long city blocks, may very well begin at one end with one style of architecture and bring up at the other end with another style, without producing any sense of incongruity. Some educational institutions in America, which I will not name, have erred seriously in following too monotonously an architectural lead. The sins of Yale are not on this side. I have not seen on this continent so noble a group of buildings as Yale can show. I am aware that I do not speak without prejudice.

The other monument of the celebration, to which too little attention has been called, is the long series of volumes, issued under the title of "The Yale Bicentennial Series," which is now in course of publication. It is an attempt to show what Yale is doing in scholarship at the present time. A mere glance at the titles of the several volumes and the names of the authors shows the great and helpful activity of the University in the lines of investigation and scholarly thought. The most widely circulated of these volumes will doubtless be Dr. Hadley's book, "The Education of the American Citizen"; but there are many others, whose educational value is of the best, and which are received by experts as excellent contributions to the world's knowledge. They are not so conspicuous as the new buildings, and they will not so long stay in the public vision, but they will remain to future generations as an evidence of the prodigious intellectual activity, which Yale is sharing with all the leading universities of the land.

It is particularly hard for a Yale man, returning to Alma Mater after many years of absence, under such peculiar circumstances, to give expression to the emotions awakened by the great celebration. I cannot attempt to do so, feeling that silence is more eloquent than speech.

EDUCATION*.

By Thos. Addison.

If one of you to-day were traveling an obscure mountain pathway that led over rough and rocky ways, where it was often difficult to choose your way aright, I am sure you would welcome the advice and guidance of some old pioneer who had traveled the way before you, and now stood ready to warn you of some of the rocks over which his feet had stumbled, and point out the path that seemed to him to lead to your desired destination. It is in the spirit of the pioneer who has traveled the difficult pathway of life some twenty years in advance of most of you that I appear here to-day in response to the invitation of your honored President to speak a few things I think I do know on the subject of education; and especially of that edueation that seems to me most desirable for the man of affairs of the present day. And by "education" I mean that instruction and training that qualifies one for the business and duties of life. (Note, please, the double qualification.) I have thought sometimes that among the students of this University there were some who expected to finish their education when they had finished their four years' course. If there are any such here to-day, then my words are not for them. For the education of whieh I speak is mainly that obtained after you have left college and begun the real work of life that lies before you.

*An address to the students at the University Meeting, November 8, 1901.

I do not mean to depreciate in the least the usual academic course. It has great and lasting value, but its value is often misunderstood. In other times I have talked with students of this University on that point, and have been surprised to learn how many expected their general academic course to fit them for some lucrative employment in the business world of to-day. To one with such expectations the usual college course is often a detriment instead of an advantage. The chagrin of failure that usually follows such expectations is always serious, and frequently ruinous. But to one who has his special life work already laid out, and looks upon his general college course as so much foundation to be built upon, then such work is of inestimable benefit, and, no matter what vocation he may pursue, it will make of him a broader, a better, and a more successful man.

I take it that there is no person within the sound of my voice but has in him the desire to win from this world such measure of success as lies in his power. And, therefore, I am not going to occupy your time in generalities, but instead I shall name some specific things that I feel sure make for the success of the individual possessing them in the business life of to-day. And by success I do not mean wholly the acquisition of material things. Money and other material things, as society is constituted, are necessary and desirable, and one may be sucessful and praiseworthy and win much of both. Rightly used, money is a blessing; wrongly used, a curse. But the winning of money alone is not success. The making of money may be "business," but the "duties" of life demand something more; and that "more" reaches out to and includes the duties one owes to his family, his neighbor, his country, and his God. And no man or woman can be considered a success whose education has not in some measure fitted him or her for the fulfilment of all these duties.

The average man of to-day probably has no greater mental capacity than the average man of a thousand years

ago, and yet the last century has seen greater advancement in the discovery and utilization of Nature's resources than many centuries previous. This great advancement is undoubtedly due largely to the fact that this is the age of specialization. The wise man no longer spreads his work over a wide area, but centers all his energies and abilities on some one thing, and perhaps discovers new and better methods of doing that one particular thing than ever had been known before. And once a man has reached the point where he can do some one thing better than anyone else, or even better than the average, if that thing is worth the doing, there is no longer any question of his employment. Employers the world over are seeking such men. He is like the trained athelete who has his work cut out for him, knows it thoroughly and can do it; and that means success. And you, if you are going out into the world to compete with that man, must do as he has done; that is, learn to do some one thing well. And what that one thing shall be a matter of early decision. If there is a Freshman here to-day who has not decided on his special life work, then he has not done what he ought to do. If there is a Sophomore, then he is blind to his own best interests. If there is a Junior, then he has already cast aside golden opportunities; and if there is a Senior, then he is negligent of his own welfare and has already thrown aside some of the weapons by which he would win success. For the four years college course can be made a better foundation for the life work if you know at the beginning what that life work is to be. So I repeat, your general academic course does not suffice to fit you for the life work of to-day. As a foundation it is worth all it costs in time and money, but it should be followed by special training to fit you for your special work. And therefore the first thing I advise is:

Decide on some one thing you intend to do, and learn to do that one thing well.

This is the day and age of superlatives. Many men seem to pride themselves on bringing into use two adjec-

tives where only one existed before, and the result does not give clearness or accuracy of speech. They seem to strive to make up in quantity of speech what they lack in quality. One of the worst and most senseless forms of exaggeration practiced by certain men who lay claim to respectability is the use of profane or indelicate expressions to emphasize their sayings. The attempt to embellish plain truth with indelicate or profane words is like daubing the Venus de Milo with mud to enhance its beauty. All such exaggeration of language is only a veil to conceal ignorance. Only callow youth and thoughtless adults resort to such accessories of language; the wise man, never.

In spite of the many cheats the business world of to-day is founded on accuracy and honesty and faith in man. It must of necessity be so. So much of the business is done on trust that a business man must avoid the man who lies and cheats as he would the plague. There is no solid and enduring business reputation that is not built upon public confidence. It is as true to-day as ever in the world's history that "Honesty is the best policy." Therefore, the second thing I would name as essential to success is:

Honesty and accuracy in word and deed in all business and social relations.

We feel that the various activities of life never crowded each other so fast as they do to-day. A man's business life moves more rapidly and covers a wider field than ever before. Distance to the busy man of affairs should be measured by hours and not by miles. If he can travel in one hour as far as his grandfather traveled in twenty-four hours, then is he able to reach as many more people and things as are measured by the difference between the area of a circle with a radius of twenty-four and that of a circle with a radius of one. The telephone and the telegraph and the typewriter still farther increase his ability to extend his business and his field of influence. And all this makes new demands on his time and his abilities. A couple of men, one at each end of a telephone

line a thousand miles long, costing five dollars a minute for its use, must of necessity think quickly and decide promptly. Two men reach their desks in the morning with a hundred things before them for their day's work. One closes his desk at a seasonable hour in the afternoon with the hundred things disposed of and is ready for the work of the next day. The other leaves his desk with a large proportion of the hundred things still there and to be added to his pile for the next day. The one has done his work leisurely, methodically, and easily. The other has been hurried and worried and wearied. The secret of success in all this lies in the ability to concentrate one's mind on one thing, keep it there until a conclusion is reached, then make the decision, put that thing behind and take up the next. Only in this way can one's work get on and be done successfully. I believe in the end it would be less harmful to decide twenty-five of the hundred things wrong than to fail to reach a decision on most of them at the proper time. Other things being equal, the men who are sought for to-day for positions of trust and responsibility where salaries are satisfying are the men capable of concentrated thought and prompt decision. And the third thing I advocate is:

Learn to concentrate your thoughts on one thing and reach a prompt decision.

It is strange, but none the less true, that the knowledge the average man lacks most is the knowledge of himself. You remember the Autocrat's designation of the three Johns.

First, the real John.

Second, John's ideal John.

Third, John known to his friends.

Rarely are these three or any two the same. And yet I believe it should be the young man's ideal and constant aim to discover "The Real John," and make that such as he would be willing and proud to exhibit to his friends on all occasions. This also is important in the struggle for success.

A young man who attempts a task he is not fitted for, and who fails, has had a blow dealt to his self respect and his reputation that is sometimes fatal to his future success, and is always serious. One of the most common types of applicants for positions that come to the average employer is the incompetent man who thinks he can do anything or everything, but who has been specially trained in nothing. Lucky for both if they part company then and there. Another type, not so common, is the young man who has been well educated and specially trained, but who disdains the lower rounds of the ladder by which he would gain necessary experience and could rapidly mount, and seeks to vault at once into the highest and most lucrative positions. Better for that young man if he can have a few years training in lower positions. And therefore the fourth thing I advise is:

Know yourself and your own capabilities.

It has been truly said that most Americans believe they have been born to great things. I have no doubt there are several within the sound of my voice who expect to be President of the United States, and still more who expect to be governors of states, generals of our army, and admirals of our new navy. All such high ideals are good and praiseworthy, provided they do not take your interest and attention away from the work in hand. It is well for us all occasionally to look beyond our little horizon and get a glimpse of what our neighbor is doing in the next field, in the next state, or in the far off land, providing we do not lose our interest in the "Day's Work" that is ours to do.

A story is told of a certain noted and successful Boston merchant whose only son had just finished his course at Harvard. The merchant had spent much thought upon choosing a career for his son without reaching a decision. His own business had become somewhat humdrum and tiresome, and he wanted something better for his son. Finally the bright thought came to him to write to a dozen or more of his business friends for advice. They all replied, and all

gave advice. But what struck him most forcibly in their replies was that not one had advised him to put his son into the business the writer was then following. And then a great light came to him, such as he had never seen before, and he knew that happiness and success lie not so much in the work a man has to do as in the man himself, and in the heart and the soul he puts into his work. He decided straightway that his son should succeed to his own business, and that he would teach him the road to success and happiness through honor, and industry, and fidelity. I am afraid this story illustrates one of the prevailing weaknesses of human character, in that we are prone to believe that our neighbor has drawn the golden prize. It is only when we have succeeded, after much effort, in wresting it from him that we find it is only plain metal like our own. And then, if we are wise, a great light breaks upon us, and we find that our prize can be made gold, if we will only put into the winning of it the gold of honor, and integrity, and fidelity to duty, and to the work that has been given to us to do. The "Day's Work" that may come to me is not the "Day's Work" that may come to you, but I would have you all know that happiness and honor and success lie not in the work, but do lie within you and within me and in the spirit we put into our work, and may be had for the seeking. And so the fifth and last thing I give you,—and if I could, I would print it on the walls of your rooms in letters of gold,—is this:

Love your work. Be faithful over a few things and you will be made rulers over many.

THE NEW STAR IN PERSEUS.*

By W. W. Campbell.

The dawn of the twentieth century is marked by several astronomical events of the first importance. A prediction as to what the closing years of the century will record would probably fall far short of the truth.

No celestial object of recent times has attracted more attention from the astronomical world than the new star in the constellation Perseus. It was discovered by Rev. T. D. Anderson, a private astronomer in Edinburgh, on the morning of February 22, 1901. At that time it was of the 2.7 magnitude; that is, about half a magnitude fainter than the Pole Star.

Information concerning the discovery was at once distributed by telegraph and cable throughout the world. The resources of all the observatories were immediately brought to bear upon the stranger, in so far as they promised to furnish us with information concerning it.

A fact of great interest was promptly announced by Professor Pickering, Director of Harvard College Observatory. Photographs of this region of the sky had been secured, in the course of their regular surveys, on February 2, 6, 8, 18, and 19, none of which recorded a star in the position of the Nova, though the plate of the last date contained images as faint as the eleventh magnitude. The Nova thus increased from fainter than the 11th magnitude to 2.7 magnitude in less than two and one-dalf days.

*The details of the Lick Observatory observations of the star and nebula are contained in the Observatory Bulletins No. 8 and No. 10.

The weather at Mt. Hamilton had been stormy, and our first opportunity for securing observations occurred on the forenoon of February 24. The circles of the 12-inch telescope were set to the proper readings, and the star was at once found, in broad daylight. Comparison of the brightness of the Nova with that of Capella showed that the former was half a magnitude the brighter. Capella is more brilliant than the average first magnitude star, and the Nova could safely be said to be of zero magnitude. In four days the new star had increased from the 11th to the zero magnitude, and had become the brightest star in the Northern Hemisphere of the sky. The intensity of its light had multiplied fully 25,000-fold.

As an illustration of the manner in which the oldest of the sciences is advancing by leaps and bounds, it may be said that from 134 B.C. to 1876 A.D. only seventeen new stars are on record; whereas in the sixteen years since 1885 nine new stars have been discovered. Photography is largely entitled to the credit of this remarkable showing.

A systematic study of the new star in Perseus was promptly undertaken by the members of our staff, making use of practically all of our instrumental equipment.

It is not expedient to describe the results of our work in detail. Only the more salient features will be referred to.

Meridian circle observations made in February and March, compared with similar observations made this fall, have fixed the position of the new star in the sky very accurately, and have shown that its lateral motion in three-fourths of a year has been inappreciable. Micrometer observations with the 36-inch equatorial have led to the same conclusions. A final statement of the distance of the new star from the solar system cannot now be made, as observations for this purpose must be continued for at least a year, in order to eliminate the effects of other elements entering into the problem. But it can safely be said that the new star is much farther away than the nearest dozen fixed stars, and it is probably as far away as the average

star. This fact is of great interest in connection with our most recent discovery concerning the Nova, to be described in the sequel.

The brightness of the new star has been carefully estimated, as frequently as necessary, since its discovery in February. Originally the brightest star in the northern sky, it is now invisible to all but the keenest eyesight on the best nights. It is a little brighter than the seventh magnitude stars. This decline has not been uniform. In the spring months it appeared to pass through a cycle of variations once in about five or six days, its maxima differing about 1.5 magnitudes from its minima; but the tendency was downward. Since the first of July there has been but little change. If we may judge by the history of preceding new stars, we shall expect this one to decline slowly, until in the course of a few years it will be visible only in the larger telescopes.

The spectroscopic observations secured with the 36-inch refractor were unusually fruitful, but it should be said that they are largely of a technical nature. One of the first results was afforded by the Mills Spectrograph. The atmosphere of the new star was found to contain, among other elements, sodium and calcium vapors. These vapors introduced fine absorption lines in the spectrum. From delicate measurements of the positions of these lines we learned that the new star was receding from the solar system with a speed of about four miles per second. These observations, combined with those secured with the Meridian Circle and micrometer, were sufficient to prove that the new star had not come in from other regions, but that its material had existed in its present position for indefinite ages past The spectroscopic observations showed that the conditions in the new star were rapidly undergoing change. The spectrum was at first almost entirely continuous, with here and there a dark line. In two or three days broad spectrum bands were developed, affording evidence that the atmosphere of the star was relatively very extensive, and

very highly heated. The extraordinary breadth of these bands left no doubt that the atmosphere of the star was violently disturbed, though the observations gave no decisive clue as to the cause of the disturbance. The character of the spectrum as a whole changed from month to month. Its earlier features were rapidly passing away, and new ones developed. The last observations secured in the spring, just before this constellation was hidden from view by the advancing sun, showed that the hydrogen lines were rapidly predominating. The southern latitude of the Lick observatory made it necessary for us to discontinue observations from May to early in July. In the latter month, as soon as the sun had passed this region of the sky, the spectroscopic observations established that while the Nova retained its stellar point-like form in the telescope, yet the spectrum was that of a nebula, the bright lines occupying the same positions as the lines in the spectra of the well-known nebulae, but the great breadth of the Nova's lines was proof that the gases composing the nebula were still in a highly disturbed state.

It is hoped that the great observatories of Northern Europe took advantage of their high latitudes to secure a practically continuous series of observations covering the important period of transition from star to nebula; but thus far no results have been announced by them.

We had anticipated that the change to a nebula would occur sooner or later, as this was the transformation through which the preceding half-dozen new stars had passed.

The next items of interest relate to the surroundings of the Nova. A long-exposure photograph of this region was obtained by Professor Max Wolf of Heidelberg on August 32. A careful examination of his plate showed the existence of a faint mass of nebulosity about six minutes of arc south of the star. As this was recorded on two plates, no doubt remained as to its character.

On September 20 Mr. Ritchey of the Yerkes Observatory

was led by Wolf's discovery to secure a photograph with his more efficient instrument. The existence of Wolf's nebula was confirmed, and the nebulous mass was shown to extend throughout a considerable area, the new star being situated near the middle of the mass. The nebulous cloud was not of uniform intensity, but included many nuclei and slender wisps.

A photograph of the same region was obtained with the Crossley Reflector of the Lick Observatory on the nights of November 7 and 8 by Assistant Astronomer C. D. Perrine, the total exposure on both nights being 7 hours and 19 minutes. The plate was developed on the following day, and a comparison of Perrine's photograph with the Yerkes photograph taken seven weeks earlier led at once to an extraordinary discovery. The principal features shown by the earlier photograph still existed, but their positions with reference to the new star had changed enormously. A cursory examination was sufficient to show that three at least, and possibly four or more, of the nuclei had moved to the south and southeast about a minute and a half of arc in the seven weeks. The amount of the motion was almost incredible, being no less than at the rate of eleven minutes of arc per year. The greatest similar displacement in the stellar universe previously known is less than nine seconds of arc per annum,—only one seventy-fifth part of the motion observed in the nebula.

However, there could be no doubt of the reality of Mr. Perrine's discovery, and I immediately announced it telegraphically to Harvard College Observatory, which is the central station for the distribution of astronomical telegrams both in this country and abroad. My telegram was sent out on the morning of the 10th of November. On the evening of the 11th the following dispatch was received: "Ritchey states a photograph taken at Yerkes Observatory on November 9 confirms the motion of nebula near Nova Persei."

Additional confirmation was also furnished a few days

later by a photograph taken at the Goodsell University, in Minnesota.

Mr. Perrine's discovery, as was anticipated, has aroused intense interest throughout the astronomical profession. It occasioned great surprise in all quarters, but it is a pleasure to say that the reality of the discovery was not questioned by any one. Additional photographs secured by Mr. Perrine in the first half of December offer further confirmation of the facts, and show that many other interesting changes are occurring. Masses of nebulosity not formerly seen were recorded on the later plates.

It is perhaps too soon to say just what bearing this discovery will have upon the explanation of the phenomena connected with new stars; but it is certain that we have witnessed the formation of a nebula. It is likewise morally certain that the new star and the nebula have had a common origin. No definite statement can be made as to the causes which called these objects into visible existence. For myself, I have no doubt that they are the products of a catastrophe. The most satisfactory theory of the origin of the Nova is that it is the result of the collision of two dark bodies. The average speed of the stars in their motion through space is between twenty and thirty miles per second. Recent observations here have shown that dark, invisible bodies are very plentiful, and therefore that collisions are not impossible. If we suppose that two such bodies, rushing through space with a relative speed of forty to sixty miles per second, were to collide, we cannot avoid the conclusion that the materials composing them would be transformed from the solid state into that of incandescent gases. There is no doubt that the product of such a collision would be heat; and it requires but a simple computation to prove that the kinetic energy of the rapidly moving bodies, transformed into heat, would be sufficient to convert the materials into highly heated vapors.

While the hypothesis just described accounts very satisfactorily for the observed phenomena, we cannot say that

it is an established fact, as we may find that hypotheses advanced later will be even better adapted.

I have spoken above of our determination of the distance of the Nova from us. It is probably no closer than the average star. On this supposition, the angular speed of eleven minutes per annum in the nebula corresponds to a linear speed of some ten thousand miles per second. A question has arisen as to whether this is a real movement of the material in the nebula, or whether it represents merely an impulse or transfer of energy, illustrated by the modern undulatory theory of light. It seems to me that we are dealing with an actual transfer of the substance composing the nebula. Two of the well-defined nebulous masses have moved more than two minutes of arc in the past two and one-half months, and their form remains practically unchanged.

This enormous speed is incomprehensible, but it must not be objected to on that account. The astronomer is constantly dealing with velocities, masses, temperatures, etc., which are as incomprehensible to him as they are to the layman. Our earth is revolving in its orbit with a speed of nineteen miles a second; the sun and its planets,—that is, the solar system,—are travelling through space twelve and one-half miles a second, as recently determined from observations made with the Mills Spectrograph. The average speed of the stars observed with the spectrograph is more than twenty miles a second, and we have observed some individual stars with velocities greater than sixty miles per second. The vapors forming the prominences at the edge of the sun have been observed to travel more than two hundred and fifty miles a second. All of these are incomprehensible to the human mind, and yet they occur under normal conditions. Now, in the case of the new star, we are dealing with the result of a catastrophe, such as a collision between two massive bodies. No one would be willing to set a limit to the velocities which might be developed as the result of such a collision.

THE CRITERIA OF HEREDITY*

By W. C. Blasdale.

Investigations which attempt to throw light upon the problems of heredity, and the same remark applies to all branches of scientific inquiry, ultimately rest upon a comparison. The mutual relations of parent and offspring, as exhibited in the characters they possess, when correlated for a large number of cases, should ultimately lead to the recognition of general laws, expressing and perhaps explaining the entire phenomena. The facts thus far accumulated, however, do not readily lend themselves to any simple process of correlation and for the most part appear to be self-contradictory. Like certainly produces like, and yet it never does so absolutely, often in the most general sense only. Variation and divergence are not less the rule than is heredity itself.

Various methods have been employed in attacking the problem thus presented. The attempt has been made to determine by direct comparison of a given form with its antecedents the point of origin of the characters it possesses. This process in all cases meets with a large measure of success, since in their general features all organisms resemble their parents or immediate ancestors; yet after having eliminated all those characters which can be traced to a previous generation, there always remains a residuum of

* A paper prepared for a meeting of the Botanical Seminar, held March 19, 1901, and revised for publication.

characters, which cannot be thus disposed of. The reason why all characters are not transmitted without change, and therefore the resemblance between parent and offspring is not absolute, may be assigned to three causes; either these characters are purely superficial and have not impressed themselves on the organism as a whole; or there is a mutual incompatibility of the characters of the parents concerned; or finally, the conditions under which the parents and offspring matured have materially altered the course of development, either preventing the recurrence of certain characters or possibly introducing a number of new ones.

On the basis of these conceptions two groups of theories have developed. The Preformationists have attempted to solve the problem of heredity by attributing to certain particles of matter residing within the organism the property of conditioning its entire development; these particles are capable of being directly transmitted from one generation to another, but where union of two organisms is effected through a sexual process a struggle for supremacy of the particles concerned may eliminate certain ones entirely or may give rise to others possessing entirely new properties. The theory also admits that external conditions may modify development to a limited degree, but postulates that such modifications are purely superficial and are not capable of being transmitted.

The Epigenisists, on the other hand, make no attempt to explain the mechanism by which characters are transmitted, but merely attribute to the cell-plasm certain general features, which tend to produce development along fixed lines, which, however, are capable of being profoundly influenced by the surrounding conditions; they fall short of explaining why the general features of a series of genetically related organisms are so fairly uniform. The one group of theories emphasizes resemblances, the other variations.

Viewing the facts presented by the phenomena of life as a whole, one can scarcely escape the convictions that there

is truth in both groups of theories. If the developmental theory is of any practical significance, it must be admitted that all the vast variety of plant and animal forms now known are but the resultant of the differential action of varying conditions of environment upon a comparatively limited number of forms. The blending or fusion of characters through sexual union scarcely explains variation, since the latter attains its maximum in certain groups (the *Agaricini* for instance) where this method of reproduction is unknown. On the other hand, the remarkable stability of all groups of organisms in their general features, even under varying conditions, *i.e.*, the fundamental fact of heredity itself, demands a lucid explanation.

As a second method of attacking this problem, the question might be asked *what* characters are transmitted without change? Is it possible to divide all the well recognized characters into two groups, one of which unites all those features which are normally transmitted in a great variety of organisms, the others those that are peculiarly subject to change? If such a classification were possible, a study of the peculiarities of the characters represented in the two groups might give us a clew to the mechanism by which they are transmitted and thus to a satisfactory theory of heredity. The data at present available are scarcely sufficient to make a satisfactory test of this method, since our knowledge relates largely to a limited number of characters only. In a general way, we recognize the fact that certain characters are more frequently transmitted without change than others. We also recognize the fact that certain characters are more subject to variation under varying conditions than others and hence we distinguish between those which are relatively stable and those which are plastic. The former group would offer the better criteria from which to study heredity, since in these characters one element of uncertainty is reduced to a minimum. It is to be noted, however, that the persistence of a character from one generation to another is not sufficient proof of its being

heredity, (using that word in its narrower sense) since this may result merely from a continuation of a similar set of conditions. If it could be shown that characters of the more plastic group were transmitted under conditions not favorable to their preservation, this would form the clearest and most definite proof of the existence of a potent heredity influence. On the other hand, the plastic group of characters offer the most satisfactory criteria from which to study variation, and the subjects of heredity and variation are so intimately associated, (since no experimental work can be carried on without considering the question of environment), that it is impossible to study one independently of the other. What is clearly needed is to make our exerimental methods comprehensive enough, and yet sufficently exacting, to enable us to recognize all the cases in which a character, whatever its nature, is reproduced in the offspring as the direct result of parental influence and secondly to recognize those instances in which changes have been effected in the characters of the offspring as the direct result of external conditions.

Hence it is evident that both classes if characters should be employed in the study of heredity if our knowledge of the subject is to be in any sense complete and if we are to avoid erroneous conclusions.

In view of these facts, the question might be raised whether our present methods of study are sufficiently comprehensive. A complete study of any living form, however simple in organization, would lead to the recognition of a long array of characters from any one of which comparison with any other organism might be instituted. Many of these, such as form, size, and color, are easily observed, others, such as the arrangement of organs and finer structure could be determined only by the use of the scalpel and microscope, others by use of the methods of the chemist and physicist, and still others by observing the behavior of the organisms under varying conditions. We might compare parent with offspring from the standpoint of form, of

chemical composition, of the functions it performs or of its reaction towards environment. To make the comparison from any of these standpoints exclusively would clearly be insufficient, to make it from all would be preferable, though perhaps unnecessary, owing to the mutual interdependence of these characters.

Thus far morphological criteria have been most largely used in the study of heredity. It is well known, however, that morphological characters are peculiarly subject to variation, and changes in form have been effected by such agencies as change of food supply or exposure to light, presence of parasites or gall-producing insects, mutilation, etc. Hence the repetition of like morphological features in a series of individuals is not sufficient evidence of heredity unless this repetition is maintained under conditions known to be unfavorable to the perpetuation of the characters concerned. Furthermore, they may fail to indicate the more important general tendencies which are characteristic of the organism as a whole.

Physiological criteria, using the word in its most comprehensive sense, should more nearly represent the constitutional or essential features of an organism, since they stand for causes and not merely for effects. Form is dependent upon function rather than function upon form, yet form is not a perfect exponent of function, since several forms may serve equally well a given function, and even if they do not do so, the process of change may be a slow one and the change of form may lag behind the change of function. Whatever theory we adopt as to the means by which heredity is effected, it seems plausible to suppose that those characters, which are more deeply impressed upon the organism as a whole, would exercise a stronger influence on its sexual organs, (and hence bring about recurrence of these characters in succeeding individuals), than those which affect a portion of the organism only. Physiological characters belong to the former category, they are fundamental, whereas morphological characters may be

purely superficial. Heredity and variation are themselves physiological processes and the attempt to study one physiological feature of an organism independently of its other physiological features, or to study a physiological process by observing changes in form only, is clearly insufficient.

Two reasons may be assigned for the neglect of physiological data in the study of heredity. The greater difficulty of making physiologieal observations is at once suggested. If we consider the more recondite physiological processes, such as those relating to assimilation and metabolism, this objection must be admitted to be a valid one, though even here the difficulties are by no means insurmountable and the end in view is of sufficient importance to warrant the effort required. Many of the more obvious physiological distinctions, such as color, odor, habitat, association with other organisms, are as easily observed as the morphologieal ones.

The second objection to the use of physiological data is based upon the idea that they are more variable, but this is by no means proven. That many physiological characters are exceedingly variable must be admitted: color and odor, for instance, are remarkably so, and early in the history of systematic botany Linnæus enunciated it as a formal principle that they were not to be trusted even as specific characters. Some of the other physiologieal characters, in so far as data are available, exhibit a high degree of stability. The sugar content of the beet furnishes an instance of this sort. By tabulating the data obtained from a vast number of analyses made in Holland sugar factories, it was shown that the sugar content forms a normal variation curve of about the same form as those obtained by tabulating statistics of the most stable morphological characters. Just as among morphologieal characters we have some that are stable and many that are plastic, so of the physiological characters some are stable and others are variable. A comparison of the relative stability of the

two groups of characters, in the present state of our knowledge, would be manifestly incomplete, yet may nevertheless present facts of interest. Of the more stable morphological group we might instance such characters as the number of cotyledons, the number of divisions and adhesion of the floral envelopes none of which are entirely free from variation. These characters are among the most stable morphological ones we know, and they are of fundamental importance in systematic botany, yet marked variations are not only produced by slight changes in external conditions but are not rare in nature. We might contrast with this group some of the physiological characters which are also of importance from a systematic point of view. The chlorophyllic function, for instance, as characteristic of the higher plants offer only a few exceptions, and these are accompanied by a deep-rooted change in the habit of life; similarly the geotropic reaction of roots, the phenomena of circumnutation, the direction of twining assumed by twining plants are examples of physiological characters to which exceptions are almost unknown. As a means of distinguishing between the larger group of organisms, plants from animals, algæ from fungi, the physiological distinctions are more satisfactory than morphological ones. Finally, as a means of distinguishing species among the lower forms, bacteria and schizomycetes, physiological characters have been found to be entirely satisfactory, and this, together with many other observations of a like nature, has brought forth the prediction* that as the science of botany progresses "physiological characters will assume even a greater importance than at present in the characterization of species," and another authority† has admitted the insufficiency of morphological characters as an expression of plant affinities. On the other hand, the plastic characters of the physiological group are more subject to variation

*From an address by W. G. Farlow before the American Association for the Advancement of Science, August, 1898.

†Greene, Pittonia, 1, 294.

than these of the morphological group. Such features as the amount of metabolism, and rate of growth, vary from hour to hour. Dantec has compared an organism to an eddy in a stream, which remains constant only so long as the forces which produce it are constant, a conception which clearly relates to processes or tendencies rather than to forms. Other physiological characters, such as longevity, length of time required for development of flower or fruit, are certainly influenced by conditions of environment. The contrast between the stable and plastic characters appears to be more striking in the physiological than in the morphological group.

Some striking illustrations of the correlation between physiological and morphological characters are worthy of note. Instances are not rare in which the latter are correlated with reference to a single physiological character. The genera *Dionæa* and *Muscipula* are distinguished by the fact that both possess adaptations enabling them to capture and digest insects. Most of the important characters of these genera represent adaptations to this one feature, and the essential or constitutional features of these plants clearly center around this fact also. It so happens that the morphological modifications which accompany this peculiar function are essentially the same in the two genera, and hence systematists have placed them in the same group, though not without protest, because of the fact that their floral structures show some rather marked differences. Is not the physiological character here represented of more significance in expressing the constitutional features of the plant than are the morphological features by which this function is executed? Likewise the peculiar floral characters of the family of *Orchidaceæ* center around a physiological distinction, *i.e.*, an adaptation to cross fertilization; the twisted ovary, monstrous perianth, and peculiar pollen cells are all expressions of the same peculiarity.

In view of the above statements, it would seem desirable to study the facts already accumulated, and to extend

these by still further experiments along two distinct lines. First, the effort should be made to establish the limits of variation of a large number of characters both stable and plastic, both morphological and physiological, by means of experiments involving change of environment; second, to determine to what extent such characters are transmitted under conditions both favorable and unfavorable to their repetition.

The importance of physiological criteria having been established, we might next inquire as to what physiological characters, out of the vast number available for the purpose, appear to offer the most valuable opportunities for acquiring facts of real significance with the least expenditure of effort. Without attempting to disparage the importance of morphological characters, or of certain physiological ones already largely utilized, the following suggestions are offered.

The question of chemical composition of organisms as a character for the recognition of heredity appears to have received little attention, yet it is clearly a fundamental and comprehensive one, for it is only through a study of the chemical changes in an organism that we are able to recognize many physiological processes. Also, chemical composition forms the basis of certain physiological characters which can be recognized by our sense of taste and smell. The metabolic and assimilative processes in the higher plants are for the most part the same. In all instances essentially the same substances are used, and these are finally elaborated as fats, proteids, and carbohydrates. The relative amounts of these groups of substances vary greatly in different plants, as may be seen by examining the data for almost any series of analyses representing the composition of some plant product grown under varying conditions. Clearly it is a fundamental difference which is expressed by the fact that the *Gramineæ* store their seeds with starch, while the *Juglandaceæ* and *Coniferæ* store theirs with fats and proteids. Frequently also, the exact

compound represented in each group are characteristic. The species of *Linum* synthesize large amounts of the glycerides of linoleic acid, while the peanut synthesizes the glycerides of arachidic and hypogaeic acids, and the castor-bean those of the rare ricinoleic acid.

Striking examples which illustrate the effect of external conditions on the composition of an organism are not rare. An instance of this sort recently arose in connection with the beet-sugar industry of California, where during a season of exceptional dryness the beets developed pectin in such quantities as to materially interfere with the separation of the sugar, a difficulty which did not appear during subsequent seasons. Another illustration might be taken from the wheat industry. The only varieties of wheat which are here found to be successful are the soft white winter wheats, which are relatively high in starch and low in protein, and the introduction of the more highly nitrogenous varieties of the North and East fails to remedy the difficulty, since in a few years they all revert to more highly amylaceous forms, apparently as the direct result of the soil and climate. On the other hand, there is abundant evidence to show that the chemical features characteristic of an organism may become permanently fixed. The changes which have been effected in the composition of most of our commonly cultivated food-plants are most conclusive. With these plants the chief aim of the plant-breeder has been to improve their composition rather than their form, since it is upon their ability to furnish wholesome food that the chief value of his efforts depends. It is through selection that such changes as an increase in sugar content of the beet from five to fifteen per cent. has been effected. That changes of environment often affect changes in composition cannot be questioned, and it is also evident that such changes can be maintained and often intensified under favorable conditions. Some experiments carried on at the Illinois Experiment Station,* having for their object the

* Journal of American Chemical Society, xxi, 1039,

improvement of the varieties of corn, illustrate the case. It was first determined that the composition of all the kernels on the same ear was remarkably uniform. Hence it was possible to select four classes of seeds, characterized by high protein, low protein, high fat, and low fat, respectively. On growing crops from the four classes of seed, all under the same condition, it was found that, though the average of the crop, as regards the particular constituent, did not attain the average of the seed sown, yet the average of the crop obtained from seed of high protein content was notably higher than that obtained from the seed of low protein content, and similar results were obtained from seed of high and low fat content, The experiments have been continued through several seasons, and there is every reason to believe that races of corn characterized by high protein and high fat are being developed. Apparently there is here a tendency for reversion to a fixed mean, yet the results clearly indicate that the chemical features are transmitted.

It is, however, in compounds resulting from destructive metabolic processes that the greatest variety in chemical composition is encountered. To a considerable degree chemical distinctions are at the foundation of the natural system of classification. Among the characters of fundamental importance in designating plant families is the character of the sap, whether acrid, milky, mucilaginous, etc., differences which are essentially chemical in their nature. In some instances we can correlate certain groups of plants with one or with several closely related compounds. Though the data are very incomplete, it is probable that the entire order *Drupaceæ* is distinguished by the presence of hydrocyanic acid, the genus *Prunus* by benzoic aldehyde, similarly all the *Cruciferæ* by iso-sulphocyanate compounds, the *Coniferæ* by terpenes, the *Myrtaceæ* by complex essential oils, the genus *Citrus* by lymonene and *Salix* by salicine. Similarly certain groups of alkaloids characterize the *Papaveraceæ*, and others the *Cinchonaceæ*. It frequently happens, however, that the

same compound is repeated in several dissimilar groups. The compound coumarin, for instance, has been reported from no less than seventeen different plants, representing ten distinct orders. In many instances it appears in a number of species of the same genus or of related genera, further research would probably show that it is characteristic of the genera *Melilotus*, *Dipteryx*, *Adiantium*, and *Anthoxanthum*. Apparently then, while chemical composition is an important criterion of the general features of a plant and is normally transmitted, it is largely subject to variation.

Essentially the same conclusions are reached by a consideration of certain other characters, color, taste, and odor, either partly or entirely dependent upon chemical composition. That the color character is subject to frequent variation is evinced by the great number and variety of color forms in many cultivated species, most of these forms being unknown in nature; yet these color variations are commonly transmitted without change from one generation to another, provided crossing with dissimilar ones is prevented. Direct connection between the color character and the amount of exposure to light and heat has been traced in many instances, between color and the presence of certain elements in the soil more rarely. A correlation between the color of seed and flower has been established in the case of the cultivated varieties of *Lathyrus odoratus*, and the species of *Mathiola*. Instances in which the color characteristic of the flowers of a given species is also prevalent in other organs of the plant are not rare, but I would cite *Primula sinensis*, *Acroclinium roseum*, *Rhodanthe manglesii*, *Dianthus barbatus*, in all of which the red flowered forms show greater or less amount of red coloring matter in the stems and leaves, the white flowered forms being practically colorless, facts which seem to indicate that the color character is not merely a local phenomena. Finally the color character finds important application as a basis of classification; it is of fundamental importance in the

classification of the *algæ*, the subdivisions of the *agaricini*, and distinguishes accurately between some of the important but difficultly definable groups of the higher plants, *Aster* from *Solidago* for instance. Further, there seem to be certain limitations with respect to the extent of color variation in most species. Instances in which species exhibit combinations of red, yellow, and white or blue and white are very numerous, but combinations of red or yellow and blue are exceedingly rare.

The immediate effect of soil and climate upon the production of perfume in plants both qualitatively and quantitatively is established by a large number of observations. Data from the essential oil industry is most conclusive. Though the plant producing the attar of roses may be grown successfully over a wide range of territory, the yield of perfume in most regions is so small as to render its cultivation unprofitable, also the amount of stearoptene or non-odorous solid constituent is known to vary greatly in oil from different localities. Similarly the amount of menthol in Japanese oil of peppermint frequently reaches seventy-five per cent., while most of the American oils do not contain above fifty per cent. English oil of lavender possesses such marked superiority over the French article that it has been sold for ten times the price, though it is possible that in this instance a distinct race of *Lavendula angustifolia* has been developed through the influence of English climatic conditions; in either case the fact is a significant one. Many instances showing the value of the perfume character as a means of defining species or genera of plants might be cited. The presence of a pronounced odorous principle in *Solidago odora* is said to readily distinguish that species from all the others of the group, and the peculiar mephitic odor of *Navarretia squarrosa* is a never failing criterion. The delicacy of this test and its persistence under varying conditions finds illustration in the cultivated varieties of roses The odor of tea class, derived primarily from *R. indica*, though representing a consid-

erable range of variation, is on the whole distinct from that of the hybrid perpetual class, derived principally from *R. damascena*, and this in turn is very different from the odor of the sweet brier, *R. rubiginosa* in its various forms.

Utilization of the sense of taste as an aid to the recognition of plant affinities has been suggested * and some of the instances cited; recognition of the family *Cruciferae* and the genus *Allium*, for instance, seems to be a most valuable criterion. Without doubt this character is subject to the same degree of variation as is found in the color and odor characters, since like them it is essentially dependent upon chemical composition.

As a means of tracing heredity and studying variation all the characters above enumerated appear to offer valuable opportunities. Evidence as to their stability, on the one hand, and their plasticity, on the other, is abundant and conclusive, which only enhances their value as criteria for the purposes named. It is probable that the utilization of the keener sensual perceptions of the lower animals, particularly insects, would in many cases materially augment the value and adaptability of this group of characters. The surprising accuracy with which many insects are able to discriminate between genera and even species in depositing their eggs is suggestive.

After having studied an organism in the passive state, that is with reference to its morphological and chemical characters, it may still be viewed in the light of its reactions. The question of what an organism will do under conditions to which it is not accustomed, to what extent it can withstand these conditions and the methods of adaptation it employs, is a fascinating subject for research, and one which throws into full relief the fundamental features of the organism concerned. From the animal kingdom and from the human race a large amount of data with respect to the effect of the introduction of poisons and to immunity from disease is already available. In the

* Pittonia II, 41.

vegetable kingdom we have a long series of facts relating to the resistance of species or varieties to frosts, or to insect pests, their adaptibility to hot or cold climates, or to dry or moist ones. The phylloxera insect attacks cultivated varieties of *Vitis vinifera* to such an extent as to render their successful cultivation in many localities impossible, but by grafting these on the hardier American species of *Vitis* the difficulty has been largely overcome. The cultivation of sea-island cotton on the islands off the coast of South Carolina was for some time impracticable owing to the tender character of the plant; gradually, however, a race of sufficient hardiness and vigor has been developed to render its culture profitable. The facts seem to indicate that the reactive characters of plants show a great range of adaptability from cases in which certain reactions are common to an entire family to those in which differences characteristic of the individual only can be recognized. Only two of the most significant groups of characters which properly belong here need be mentioned.

The phenomena associated with the process of grafting are of especial significance. All organisms possess certain distinctive features which permit of their union into a single individual in some instances and render this difficult or impossible in others. Presumably a similarity of the structural units of the two organisms is one of the essential conditions of such a combination, but a more important requirement is a similarity of the nutritive processes. The elaborate series of researches recently carried out by Daniell* have added much to our knowledge of this subject. This investigator finds that though a partial union (graft by approach) of two plants, often of widely divergent natural relationships, is possible in a great variety of cases, true unions, in which one form develops upon another even to the point of fruition, are rather narrowly limited. He concludes that in the orders *Rosaceæ*, *Cruciferæ* and *Leguminoseæ* the limit of such grafts is confined

* Revue General de Botanique. (1900.)

to genera of the same tribe, with the *Solonaceæ* and the *Umbelliferæ* to different tribes, and with the *Compositeæ* to the sub-family.

The plant known as *Pereskia aculeata* is one of the few forms of cacti which develops and maintains true leaves during its entire life. It is of a climbing habit and presents other characters which are rare in this group, yet its evident relationship with the *Cactaceæ* is shown by the ease with which *Epiphyllum truncatum* can be grafted upon it. Facts of this sort are truly indicative of the deep-seated physiological processes which characterize the organism, and should be of especial significance in determining the affinities of plants of mixed parentage or doubtful relationship. Essentially the same observation would apply to pollination. Here also there must be a mutual adaptation of the two sets of generative organs, between the pollen grains and the stigmatic secretion which induces germination, between the form and possible length of the pollen tube and the structure and composition of the ovules. Morphological, chemical and physiological characters are all employed in the correlation; as far as experiments show, this correlation exists only rarely between different genera of the same family, more often between different species of the same genus.

A second line of experimental inquiry, which seems worthy of further development, relates to the connection between host and parasite. Parasitism has thus far been studied largely from the point of view of the parasite. In determining the specific relations of fungi, mycologists are accustomed to use the host-plant inhabited as one of the most important diagnostic features. From his standpoint the characters of the fungus are expressed by the plant that it inhabits, but there is just as much reason to believe that in many cases the fungus also expresses the character of the host-plant. In order that the relation of host and parasite can exist, there must be a certain correlation between the characters of both the organisms concerned. If it be

found that a certain parasite regularly appears on a given host while a closely related plant, under like conditions of infection, never becomes infested, the evidence would seem conclusive that the two plants differ in important particulars.

The study of the rusts and smuts is especially instructive in this connection. In these groups we have a great number of species inhabiting nearly all natural orders of flowering plants, yet the connection between species of host and parasite is very sharply defined. Many correlations exist between certain genera of rusts and certain families which serves as host-plants, or between certain species of rust and certain genera of host-plants. Of sixteen species of *Phragmidium* all but two doubtful ones (*P. ellisii* and *P. deglaubens*) inhabit *Rosaceous* genera; of the seven species of *Gymnosporangium*, all but questionable *G. guaraniticium* inhabit *Pomaceous* genera in the *æcidial* stage and *Coniferous* genera in the *teleutosporic* stage; similarly all the twelve species of *Ravenellia* are found on *Leguminosæ*, twelve of the thirteen species of *Peridermium* are found on either *Pinus* or *Abies*, and four of the six known species of *Chysomyxa* inhabit *Ericaceæ*. Illustrations of the second kind of correlation are exceedingly numerous, indeed, it is rare that a rust is limited to a single species of a genus.

The fact that there are important exceptions to such correlations does not lessen their significance. Possibly in some instances our standards of generic and specific limitations are at fault; in many cases conditions favorable to natural infection are not met with, and hence unless actual experiment has shown that infection cannot take place, its absence is not conclusive; finally, the adaptability of the parasite concerned must be determined. As in all lines of experimental inquiry, standards must be established before results can be interpreted. Just as in the science of paleontology the range of life of a given species must be determined before we can use it as a means of estimating the age of a given formation, so we must here first establish

through known relations the limits of adaptability of the species to be used in a given experiment.

Experimental work along this line is very meager, but that of Eriksson and Henning in Sweden and of Carleton in the United States on the rusts of cultivated cereals are of especial significance. It has long been known that certain varieties or wheat are rust-proof, *i.e.*, do not become infected with the grass inhabiting species of *Puccinia*. With the object of determining the limitations of parasitism between certain species of *Puccinia* and various species and varieties of grasses, the above-named investigators made a long series of culture experiments. The results of these experiments established the fact that, in addition to the previously recognized species of *Puccinia*, there are certain "form species," nearly or absolutely identical as far as morphological features are concerned, yet definitely limited in their ability to infect certain species of cereals. The significance of these results is that they emphasize the narrowness of the limitations between which parasitism can exist. They therefore suggest a method for detecting physiological or constitutional differences in plants, other than those manifested in their morphological or chemical characteristics. A striking illustration of the value of this method of detecting affinities, taken from the behavior of the cultivated varieties of roses, might be cited. In California all the varieties which retain to a considerable extent the characters of *R. Damascena*, that is, the hybrid perpetuals and many of the hybrid teas, are more or less subject to the attacks of *Phramidium subcorticum*, while I have not yet found any of the tea class, derived largely from *R. indica*, thus affected. Culture experiments would perhaps enable us to determine with the greatest accuracy the relationship of any given variety to the two species named.

UNIVERSITY RECORD.

By Victor Henderson.

The native languages of California will soon be spoken by no man, and will endure only on the phonograph cylinders or in the written records now being made, through Mrs. Hearst's liberality, by members of the Department of Anthropology of the University of California.

Time presses. For illustration,—Dr. Alfred L. Kroeber has found on the lower Trinity river two aged men who are the only living beings who can speak Chimariko. Of these, one is too senile to give aid, the other too superstitious. The language will probably die with them.

Four distinct Indian speech communities yielded linguistic and ethnological material to Dr. Kroeber's researches between September 16 and November 11—the Yurok, on the lower Klamath, each of whose settlements was visited, and two of whose ceremonials were witnessed; the Wishosk, about Humboldt bay, whose language and religion persist, but whose old manner of life is lost; the Karok, on the middle course of the Klamath, and the Hupa, on the lower Trinity. During this journey nearly three hundred pieces were obtained for the museum.

The mythology, speech, and life of the Hupas Wailakki, and other Athabascan tribes are the subjects of Mr. Pliny E. Goddard's researches. At the Battie Raneheria, on October 7, he saw a burial, at Round Valley he wrote from an Indian's dictation the texts, in Wailakki, of twetny

myths, and recorded on the phonograph nineteen songs. Mr. Goddard has recently worked out a Konkau vocabulary, and has made ethnological purchases, ethno-botanical collections, and studies of Indian and pioneer tradition.

The antiquity of man in California is being studied under the direction of Professor Frederic W. Putnam of Harvard, chairman of the Advisory Committee, and Professor John C. Merriam. During October, caves along the McCloud were examined by Mr. Herbert W. Furlong. Remains were found of Quaternary mammals, but not of man. The Quaternary beds and the shell heaps around San Francisco bay and San Pablo bay are being examined by Dr. Merriam, Mr. Sinclair, and Mr. Vance C. Osmont in order to determine the age of the oldest California shell heaps made by man, and their relation to late Quaternary beds containing remains of an extinct fauna. Next summer a search for human remains will be made in the auriferous gravels.

Dr. Alfred C. Haddon, F.R.S., University Lecturer and Fellow of Christ's College, Cambridge, Professor of Zoölogy in the Royal College of Science, Dublin, and President of the Anthropological Institute, lectured at the University from November 21 to 27 on "Primitive Peoples—Ethnographical Studies of British New Guinea and Sarawak."

A choice collection of native implements, utensils, weapons, garments, and sacred objects from New Guinea and other islands inhabited by Melanesians, recently purchased for the University by Mrs. Hearst, served to illustrate Dr. Haddon's lectures.

The new fireproof temporary storehouse now contains two hundred and sixty-four cases of materials for the anthropological museum, and some two hundred and fifty cases are in transit. Among the objects recently receeived are ten cases of cliff dwellers' remains, and twenty-one cases containing stone sarcophagi other Etrusean antiquities, an ethnological collection from Alaska, and some Philippine specimens.

APPOINTMENT OF DR. SHAW.

The beet sugar industry will be the particular concern of George Wright Shaw, Ph.D., who has been called to the faculty of the College of Agriculture as Assistant Professor. Dr. Shaw resigns the post of Chief Chemist and Agricultural Expert for the Colorado Sugar Manufacturing Company at Grand Junction, Colorado. From 1891 to 1900 he was State Chemist of Oregon, and Professor of Chemistry and Chief Chemist of the Experiment Station of the Oregon State Agricultural College at Corvallis, Oregon. From 1889 to 1891 Dr. Shaw was Professor of Chemistry and Physics at Pacific University, Forest Grove, Oregon, and from 1887 to 1889 he held a similar position in Whitman College, Walla Walla, Washington. He was born in 1864 at Bradford, Vermont, and in 1887 received the degree of A.B. and in 1889 of A.M. from Dartmouth. During his nine years at the Oregon State Agricultural College Dr. Shaw published fifteen bulletins on important agricultural topics. He has been a constant contributor to the agricultural press. The American Book Company in November published a volume of "Laboratory Exercises in General Chemistry" prepared by Dr. Shaw.

DAIRY INSTRUCTION.

Mr. Leroy Anderson, Instructor in Dairy Husbandry, will spend the coming half-year in travelling about the State giving assistance and instruction at dairies, creameries, and cheese factories. A stay of a day or two will usually be sufficient to make suggestions and render assistance in remedying defects in dairy products. Whenever possible, meetings of farmers and dairymen will be arranged at which Mr. Anderson will discuss some of the problems of dairy husbandry. The work will be begun by a month's journey in Southern California.

This is a part of the University's plan of offering practical instruction, according to modern methods, in dairy husbandry. During the past nine weeks thirty-seven

students have been in attendance upon the short course in dairying given at the University.

THE PEACH MOTH.

The peach moth, which is causing great injury to orchards in Placer county, is to be studied by the University, and means sought for its extinction. Mr. Warren T. Clarke, an advanced student in agriculture, has been appointed Assistant in Entomology for six months from January 1, 1902. He will go to Newcastle to begin this investigation. Mr. Clarke's bulletin on the potato moth, just issued, is a valuable contribution to knowledge.

LEAVES OF ABSENCE.

Professor Edward Bull Clapp, head of the Department of of Greek, has been granted leave of absence for 1902–03. He will spend most of the year in Athens.

Professor M. E. Jaffa will spend the year 1902–03 at Wesleyan in investigations in dietetics under Professor Atwater's direction.

Professor M. W. Haskell will be on leave during 1902–03, and Professor Frederick Slate, head of the Department of Physics, from January to August, 1902.

LICK BULLETINS.

The University is publishing a series of *Bulletins from the Lick Observatory*, in which important results secured at Mount Hamilton may promptly be made available for scientific use.

The Sumatra eclipse expedition, which, through the generosity of Mr. William H. Crocker, secured such valuable results; Astronomer Perrine's remarkable discovery of motion in the nebula of the new star in Perseus, exceeding in swiftness any stellar motion ever before detected, and new observations of double stars by Atronomer Aitken have been the subjects of recent *Bulletins*.

Director W. W. Campbell on November 9 was elected Foreign Associate of the Royal Astronomical Society.

ENTRANCE REQUIREMENTS.

A further step in the raising of the standards of the Medical Department is the announcement that, beginning with the autumn of 1905, two years of college work will be a requirement for entrance. These two college years must have included successful study of general inorganic and organic chemistry and quantitative analysis, general physics, and physical measurements, general zoölogy, including laboratory work, a year of English composition, and a reading knowledge of French and German.

A uniform list of admission requirements for the Colleges of Letters, Social Sciences, and Natural Sciences was adopted at the meeting of the Academic Council on December 13. The new system is extremely flexible. It affords to California high schools abundant freedom for development on lines of their individual choice. It frees students from the necessity of choosing, while still in the high school, between the three University courses of general culture. The revised admission requirements, which are almost exactly the same as those for Harvard College, are as follows: English, two units; Greek, French, or German, two; Latin, three; History, two; Mathematics, two; Physics, one; elective, three. The total number of units required is now fifteen,—an increase of a half unit. In flexibility there is a great gain.

The new system will go into effect in 1906. From now on, however, any student who wishes may offer as his preparation courses arranged as in the new scheme.

This unification of the admission requirements for the three colleges of general culture was decided upon after over a year's discussion in the Schools' Committee and in the faculty, and after President Wheeler had sought the written advice of all the high school principals of the State.

Under the new system a student may enter the College of Letters who has had no Greek in the high school, and only three instead of four years of Latin. The intrant to the College of Social Sciences may offer either French or

German or Elementary Greek, and must offer one year of History besides Civil Government. Both Advanced English and Advanced Latin are made electives. For admission to the College of Natural Sciences the intrant must, according to the new plan, offer three years of Latin, and in addition French or German or Elementary Greek.

Among other noteworthy features of the new system are the addition of Physiography, based on modern nature-study work, to the list of science subjects; the addition of English History to the group of subjects that may be offered as units in History, and the reduction of the requirement in Mathematics from two and one-half to two units.

For the coming half-year the examiners of schools which seek accrediting will be as follows:

Professor Sanford, Latin and English; Dr. Ferguson, Latin and History; Dr. Noble, Mathematics, Physics, and Chemistry; Professor Schilling, Modern Languages; Professor Clapp, Greek; Professor Kower, Drawing; Professor Setchell, Biology.

UNIVERSITY LECTURES.

Robert M. Wenley, Sc.D., D.Phil., Professor of Philosophy in the University of Michigan, has accepted an invitation to deliver the annual address before the Philosophical Union, on August 29, 1902. He will speak on some leading topic connected with Plato's Republic,—for the present year the subject of the Union's study.

Among the speakers for the remaining meetings of the year, —held on the last Friday of each month in room 1 of the Philosophy Building,—will be Mr. George H. Boke, Mr. W. H. Gorrill, Dr. E. C. Moore, Dr. W. P. Montague, Professor George M. Stratton, Mr. H. A. Overstreet, President Wheeler, Professor C. M. Bakewell, Professor Charles Mills Gayley, and Professor George H. Howison.

At the University Meeting on November 8 the speakers were Thomas Addison, M.D., Pacific Coast Manager of the General Electric Company and President of the Sacra-

mento Gas, Electric, and Railroad Company, and President Wheeler. Dr. Addison spoke on "Education," and President Wheeler on the Yale Bicentenary, from which he had that morning returned, and on Theodore Roosevelt as man and President.

At the University meeting on November 22 Dr. Alfred C. Haddon spoke on English University life as exemplified at Cambridge, and Mr. Walter Damrosch, the composer and conductor, on "Music."

Dr. William H. Tolman of New York, Director of the Industrial Betterment Department of the League for Social Service, spoke at Hearst Hall November 14 on "Studies in the Factories and Workshops of the World."

Mr. J. Richard Freud, Secretary of the San Francisco Merchants' Association, spoke for the College of Commerce on November 15 and 19 on "The Civil Service."

MRS. HEARST'S RECITALS.

Mrs. Hearst entertained the members of the University at three recitals in Hearst Hall by musicians from the Grau grand opera company. At each concert Hearst Hall held more people than, probably, were ever seated there before. The recitals were most unusual in character, and were deeply enjoyed by the University.

On November 22 Mr. Walter Damrosch lectured, with his own piano illustrations, on Wagner's "Parsifal." November 25 the singers were Madame Ernestine Schumann-Heink and Mr. David Bispham. November 30 Madame Suzanne Adams and Mr. Scotti sang, and Mr. Leo Stern played several 'cello solos. At both concerts the accompanist was Professor Reuss of the Royal Conservatory of Music, Dresden.

Mrs. Hearst has presented to the University a grand piano, to be used for concerts, receptions, and other student gatherings in Hearst Hall.

Another recent gift from Mrs. Hearst is two admirable portraits in oil, of much historical interest, one repre-

senting Captain John Augustus Sutter, on whose estate at Coloma gold was discovered in February, 1848, and the other Hon. John B. Felton.

GIFTS TO THE UNIVERSITY.

Mrs. A. S. Hallidie has presented to the University a choice collection of minerals, and several fine specimens of fossil fish from Green River.

Among other recent gifts are one hundred and fifty specimens of rocks from classical European and American localities, and one hundred and fifty specimens of minerals, presented by Dr. A. S. Eakle, of the Department of Mineralogy; twelve ore-tanks for the Mining Department, presented by the Pacific Tank Company, San Francisco, and several tons of ore, presented by the Nevada Metallurgical works of San Francisco.

PRESIDENT ELIOT'S VISIT.

President Charles W. Eliot of Harvard will deliver the Charter Day address on March 23, 1902. President Eliot's visit to the Pacific Coast was undertaken expressly for this purpose, and was not planned until after President Wheeler had invited him to be the Charter Day speaker.

STUDENT AFFAIRS.

By W. H. Dorn.

A local chapter of Sigma Xi, the national scientific honor society, has been founded at this University. Sigma Xi is a scholarship fraternity, analagous to Phi Beta Kappa but confined exclusively to those engaged in scientific work. Membership in the Eastern chapters is granted for marked ability in scientific research rather than for a uniformly high record in class work. It is intended to apply the same test in the local chapter. The charter members are Dr. Eakle, Dr. Morgan, Prof. Setchell, Prof. Jepson, Mr. LeConte, and Dr. Ward. An election of senior and graduate members will be held.

A new honor society entitled Mim Kaph Mim has been formed in the Department of Chemistry. The objects of the organization are to promote chemical research and maintain an interest in chemical work among the members after graduation. Membership is elective, and will be confined to those who have shown a high grade of scholarship and promise of future success.

A Press Club has been organized at the University of California for the purpose of advancing the literary and financial interests of the regular college publications. Membership is elective from among the prominent workers on the *University of California Magazine*, the *Daily Californian*, the *Occident*, and the *Blue and Gold*.

A Law Club has been formed for the purpose of establishing mock courts for practice work in law. Membership

is confined to those students of the University taking senior or graduate work in the Department of Jurisprudence.

A debating team from the Hastings College of Law was successful Friday evening, November 20, in winning the sixth annual Hastings-Congress debate. The question was: "Resolved, That the policy of disfranchising the negroes in the South is wise," with the understanding that the word "policy" should not involve the question of constitutionality. Hastings argued on the negative.

With an average weight of eleven pounds less to the man and against the disadvantages of a steady rain and a consequently heavy field, the University of California football team won a splendid victory from Stanford on the afternoon of Saturday, November 9, in the eleventh intercollegiate contest. The score, 2–0, fails to give a true estimate of the relative merits of the work of the two teams. The ball was in Stanford territory most of the time, and twice was California dangerously close to her enemy's goal line. Had it not been for a disastrous fumble on the seven-yard line, California would have scored a touch-down in the first fifteen minutes of play. The Stanford team was completely outclassed both in defensive and offensive playing. The California line held Stanford for down after down and Stanford was forced to yield yard after yard to the lighter California line and backs. The score was due to a touch-back made after Overall had broken through the Stanford line and blocked Hill's kick. The team work of California's eleven was excellent, and each individual played with a spirit that has never been equalled by the members of a Pacific Coast team. The line-up was as follows: L.E., Starr and Womble; L.T., Albertson; L.G., Stowe; C., Gendotti; R.G., Overall and Stroud; R.T., Hansen; R.E., Hudson; Q., More; L.H., Mini and Sherman; R.H., Womble and Whipple; F., Duden.

On Saturday, October 19, the Stanford Freshman team defeated the California Freshman team at the Sixteenth

and Folsom street grounds, San Francisco. The score was 11 to 5, Stanford making one touch-down with goal and one place kick, California making one touch-down. The two teams were well matched. Both were good on the offensive and both weak on the defensive. Neither team yielded the ball on downs during the game. Stanford's victory was due to a great extent to the playing of their half-back, Tarpey, who in the second half made a touch-down by recovering the ball, which had been blocked when he attempted a place kick, and running with it for a touch-down through a scattered field. In the first half he succeeded in making a beautiful place kick from the thirty-yard line. Toward the end of the second half the California Freshmen seemed to take new life. This was due very much to the entry into the game of Graves, a sub half-back. The latter secured the ball and carried it some seventy-eight yards to a touch-down. From this point on to the end of the game California played the better ball, but was unable to score again.

The following are the scores which California made against the Olympic and Reliance club teams in her games with them:

Saturday, September 28—California, 0; Reliance, 0.
Saturday, October 5—California, 5; Olympic, 0.
Saturday, October 12—California, 6; Reliance, 0.
Saturday, October 26—California, 6; Olympic, 5.

The regular Varsity team with six substitutes will be sent south during the Christmas vacation. This was determined upon at a reeent meeting of the Executive Committee of the Associated Students. The team will play the Los Angeles Athletic Club team on Christmas day in Los Angeles, and on the following Saturday will meet the Perris Indians.

Graduate Manager Decoto made his complete annual report at a meeting of the Exeeutive Committee of the Associated Students ealled for that purpose. This report

shows that athletics for the season brought in $13,577.20 and cost $10,543.88; balance $3,033.32. The receipts of the big game this year were about $3,250 less than last year. Had they been as large, the balance of this year would have exceeded last year's by $1,250.

Many rallies attended the closing days of the recent foot-ball season. First there was the "Axe Rally" on the bleachers, November 6, after the foot-ball team's final public practice The "Smoker Rally" followed the next evening in the Gymnasium. This was probably the largest and most enthusiastic gathering ever held at this University for the purpose of encouraging the foot-ball team. A number of graduates spoke, among whom were Wm. R. Davis, Frank Powers, and John R. Glascock. At 11:00 a.m. the Monday following the victory in the intercollegiate match a "Jubilee Rally" was held in front of the Gymnasium. President Wheeler, Colonel Edwards, Coach Simpson, and a number of men of the team made short speeches.

The Women Students tendered a reception to the members of the foot-ball squad in Hearst Hall on the evening of October 31, to which all students were invited. On the evening of Monday, November 11, the Alumni Association of the University gave a banquet to the members of the victorious team, at the rooms of the Merchants' Club, in San Francisco. There were present some fifty alumni, the fourteen members of the team, and a number of the faculty.

The Sophomore crew won from the crews of the other three classes in the semi-annual Class Regatta. This was held on the race course, the start at Sessions Bay, Saturday afternoon, November 23.

The fall training on the track was concluded October 19 by a try-out. Several of the Freshmen made good records. Very few of the old track men took part in the meet, and of those that did only a few entered their regular events.

On the evening of the inter-collegiate foot-ball game.

Monday, November 9, one of Rostand's comedies, "The Fantasticks," was presented in English at the Alhambra Theatre in San Francisco. The cast was composed entirely of University students and was under the direction of Professor Syle. The play was an unqualified success both dramatically and financially.

Friday, November 29, was Junior Day for the Class of 1903. In the afternoon a curtain raiser, "Cave Canem," by J. M. Koford, and a farce, "Wing," by Miss Bertha Janes, were presented at the Macdonough Theatre, Oakland. Both were well received by the friends of the class, who filled all the seats and standing room. The farce was one of the best that has ever been given by a Junior Class. It ranks with "James Wobberts," hitherto the standard. The entire cast of "Wing" seemed particularly well chosen and acquitted itself most commendably. In the evening the Junior Promenade was held in Harmon Gymnasium, and was a social success.

The following report has been made by the Manager of the 1902 Blue and Gold: Cash receipts, $4,081.88; cash disbursements, $4,056.08; balance on hand, $25.80.

Nineteen candidates were initiated into Skull and Keys Wednesday, October 23.

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AMERICAN CONSULAR SERVICE.*

By ELI T. SHEPPARD.

ORIGIN, HISTORY, AND NATURE OF CONSULAR ESTABLISHMENTS.

The consular and diplomatic service of the United States, like that of other nations, stands apart and differs in a most important particular, in respect to its character, from all the other administrative agencies of the government.

From the very nature of their employment, and the character of their official duties, consular and diplomatic representatives come within the general notice and under the special protection of the law of nations. This fact alone, independent of the vital and delicate interests confided to their care, gives to such officers a peculiar standing and dignity in the eyes of their countrymen and of the world.

Consular and diplomatic officers are still further distinguished and marked out from those of every other branch of the national civil service by the fact that all their fundamental rights, privileges, and powers as public agents of the nation which they represent depend primarily upon the principles of international law and the usage and customs of nations. By long established practice common among civilized nations, these officers are everywhere recognized as coming within the purview of public law and as forming a definite factor in the economy of the world.

*Lectures delivered before the students of the College of Commerce of the University of California in March, 1901.

When the United States became a separate and independent power and entered the great circle or family of nations, it inherited, so to speak, the consular and diplomatic system of the old world, as a kind of birthright from the civilization of Europe.

Our government has always recognized this important fact, and has maintained from the beginning of its intercourse with foreign nations that our consuls especially have certain rights and privileges coming to them from the common law of nations; though subject, of course, to abridgement by Congress and to enlargement by treaties.

The Constitutional Convention at Philadelphia in framing the organic law of the Republic, recognized consuls as existing officers under the law of nations, and carefully provided that original jurisdiction over all cases affecting foreign ambassadors and consuls should be vested exclusively in the Supreme Court of the United States.

"Considering the importance of the consular functions," says Chancellor Kent, "and the activity required of them at all the important maritime ports, and the approach which consuls make to the dignity of diplomatic characters, it was a wise provision of the Constitution which took the jurisdiction over them out of the State courts, and vested it exclusively in the supreme tribunal of the nation."

When we consider the number of such officers, and the important and delicate functions which they perform, it is not too much to say that they constitute by far the most useful and important part of the machinery by which our intercourse with the world is maintained. Deputed to watch over the commercial interests of the nation, and entrusted with the duty of protecting and defending the individual rights of our citizens in foreign lands, our consular officers are preëminently the representatives of American character and manners.

Scattered throughout the whole world, and occupying an eminent social position in all the official and commercial circles of different countries, and performing duties which

bring them into close contact with all classes of the people among whom they reside, the influence and utility of our consular representatives are even more important than those of the higher class of foreign agents who are more strictly styled the Diplomatic Corps. To a nation essentially commercial, like the United States, there is no administrative agency of the government more useful or more important than the consular service, not only as a means of conducting our foreign affairs, but as an agency for the protection and promotion of foreign commerce. Consuls are the commissioned sentinels of the nation, stationed at every outpost of the world for the purposes of commercial observation as well as of civil authority.

In a country with a changing civil service like ours, it is of the highest importance for every young man to acquire a knowledge, not only of the fundamental principles of the commercial policy of the nation, but also to acquaint himself with the duties and functions of its consular and diplomatic representatives. A knowledge of the history, nature, and functions of this branch of the civil service is not only desirable as forming no small part of a liberal education, but is absolutely essential for anyone who expects to engage successfully in wide commercial operations, or who hopes to enter the foreign service of the country. Every young man, to be sure, may not enter or even desire to enter the consular or diplomatic service, but everyone can and should qualify himself, not only that he may exercise an intelligent influence as a citizen in shaping the foreign policy of the nation, but that he may be suitably equipped to discharge with credit to himself and to his country those positions of public trust which it may be his duty as a citizen to fulfil in after years.

It is generally considered, by those who have made the subject a special study, that a preparatory course of reading for students or members of the consular and diplomatic service should embrace, at least, an outline history of the origin and early development of consular institutions. The

student who would understand the modern consular systems of the world should know something of the early commercial institutions and maritime usages of Europe, because it was in the commercial and maritime institutions, laws and usages of Europe during the Middle Ages that all the fundamental rights, privileges, and functions of consuls in modern times had their origin. The germs of nearly all the principles of maritime and commercial law, and of many of the ideas which cluster around the modern system of international law, had their early development, if not their origin, in the customs and usages of the maritime and commercial states of mediaeval Europe.

The practice of maintaining consular agents at foreign ports and cities for the protection of commerce, navigation, and trade, dates back to the very beginning of modern civilization. Consular institutions closely resembling those of modern times were common throughout Europe centuries before the practice had become common of maintaining permanent diplomatic agents abroad.

From the eleventh until the fifteenth century, consular officers in Europe, in addition to their ordinary duties of a commercial character, performed many of the functions and enjoyed many of the rights, privileges, and immunities of modern diplomatic representatives.

The consular system, it may be said, was the beginning of the diplomatic service. International law—the code of diplomacy—was as yet in the formative stage of development, and the consul of that early age was like one crying in the wilderness,—the forerunner of the diplomatist who was to come after him.

While it would be exceedingly difficult, perhaps impossible, to trace the origin or give an accurate account of the development of consular jurisdiction as it existed in Europe in the Middle Ages, it seems certain that consular institutions in a rudimentary form have existed among commercial nations from the earliest times.

It is rather surprising that the public libraries of

Europe, where consular institutions had their origin and early development, contain but three or four books which profess to give even an outline of their history. This seems all the more surprising when we remember that the consular system is coeval with modern commerce, and that consular institutions have exercised a prodigious influence on the political and economic conditions of Europe for nearly ten centuries. Even so thorough and so thoughtful a writer as Gibbon passes over the subject, in his Decline and Fall of the Roman Empire, with a few brief paragraphs. It is not so surprising, however, that ancient writers should have overlooked the subject, especially when we remember that Cicero, the greatest orator and advocate of the Roman Empire, believed that the subject of commerce was unworthy the study and beneath the dignity of the conquerors of the world, and that Plato, the first philosopher and political writer of Greece, declared that commerce would work the ruin of Hellenic civilization.

The sneering remark of Napoleon that "the English were a nation of shopkeepers," was only a feeble echo of the barbarian maxim of the conquering Romans, who despised the occupation of a merchant.

The advantages of some kind of magistracy for the settlement of mercantile and marine disputes seem, nevertheless, to have been obvious to the ancient Greeks and Romans. Even in the most primitive ages the operations of foreign commerce, particularly in maritime cities and ports, were liable to involve national interests as well as the individual interests of merchants and traders. Not only the disputes of foreign merchants, but especially the presence of foreign vessels and seamen in the ports and harbors of marine cities must have rendered necessary the presence and authority of a magistrate of some sort, to settle their disputes and preserve public order.

History informs us that the ancient Egyptians, the Chinese of antiquity, permitted maritime and commercial disputes with foreign traders to be decided by a high priest

in a temple at Memphis and other cities, dedicated to their gods for that purpose. When the Greek or Phœnician merchant trader bought corn from an Egyptian, and either the corn was not up to sample, or the foreigner refused to pay the price agreed upon, the parties were summoned before the high priest in the temple of justice, who decided the case, and took a portion of the corn for his judicial services.

Eight hundred years later, at Athens and other Greek cities, officers were elected or appointed who were instructed by a decree of the people to entertain strangers and perform the functions of magistrates in the settlement of disputes with foreign merchants, and for keeping foreign sailors in order.

It was the custom of the Greek states from the earliest times to enter into treaties with one another, determining the principles of law which they would mutually observe and enforce in favor of one another, and the mode in which a citizen of either state might plead and obtain his rights in the courts of the other. For this purpose each state elected agents, called proxeni, a kind of consuls, who resided in the ports of the other.

From one of the orations of Demosthenes we learn that these officers held their court on board the foreign vessel in port, and "decided the disputes of sailors and merchants in a summary manner, according to their own confessions and the testimony of witnesses"; and also that another class of officers were the supreme judges of all mercantile and maritime disputes.

Like the consuls of modern times, the Greek proxenus at Athens and other towns was permitted to affix above the outer door of his official residence the coat of arms of the town or city in which he exercised the duties of his office.

Plutarch gives an interesting account of the manner in which Alcibiades, while acting in this capacity as the public host of the Lacedemonians, and while he had charge of the prisoners taken at Sylos, availed himself of the privilege of his office to revenge himself upon the Athenians.

Herodotus, the father of history, in his account of Teos, the birthplace of Anacreon, gives a detailed account of the maritime magistracy of that place and of the jurisdiction which it exercised over foreign commerce four centuries before the Christian era.

Plutarch also mentions the existence of a species of magistrates in the Macedonian ports, on the Adriatic Gulf, five hundred years before the Christian era, named "*Polites*," who were entrusted with the regulation of the commerce of those cities with the Illyrians, a neighboring nation of traders.

From a number of facts recorded in history, the inference is plain that although many of the ancient maritime nations were ignorant of or hostile to the principles of maritime justice, there existed amongst some of them at least a well defined system of consular jurisdiction very similar to that of later times. In every instance, however, of which there is any authentic account, the officer exercising such authority was a native of the place or port where he resided, and not of the country of the foreign merchant.

The notable exceptions to the rule were the ancient Phœnicians and Carthaginians, who owed their supremacy and glory to maritime commerce, and who permitted no foreign vessels or traders to visit their ports, under penalty of death.

The Carthaginians were the corsairs or pirates of the Mediterranean from the beginning of their history, just as their descendants, the natives of Tunis and Tripoli, were when Commodore Decatur made his brilliant descent upon them in 1815, and put an end to their piratical depredations on American commerce.

The Republic of Rhodes was the first nation of antiquity to establish a humane and liberal code of maritime laws. The Republic or city of Rhodes is associated in the popular mind generally with the colossal bronze statue which was so long erroneously represented as bestriding the entrance to the harbor of that ancient seat of commerce

and oratory. Its greatest monument and its chief interest for us, however, was its celebrated maritime code, which was adopted during the reign of Augustus as a part of the maritime laws of Rome, and was afterwards incorporated into the Pandects of Justinian. Seven centuries after the reign of Augustus this celebrated code reappeared in the maritime laws of the Republic of Amalphi. The historian Hume, in his account of Richard III, states that no event in the middle ages tended so much to the improvement of maritime usages as the accidental discovery of these laws in the Tables of Amalphi.

Although the ancient Romans, as Cicero tells us, regarded the business of a merchant as altogether beneath the dignity of the masters of the world, they were far too sensible a people to underrate the value of foreign commerce; on the contrary, we have the testimony of Cicero himself to the fact that the city of Corinth was destroyed by a Roman general for having wantonly ill-treated a simple Roman citizen who had been sent there in the interest of commerce.

Nearly all that we know definitely, however, concerning the commercial institutions of the Romans is that, like the Greeks before them, they had commercial magistrates who decided the disputes of merchants and sailors in the cabins of vessels.

The title of consul itself is derived from the Romans. As every one knows, the name consul (which is not to be confounded with *counsel*) was originally employed to designate the office of the first magistrates of Rome. After it ceased to distinguish the chief magistrates of Rome it was adopted by the maritime cities and republics of the Mediterranean as the title of their maritime judges. These early judges or consuls had no special concern with foreign commerce; they were simply local municipal officers. Later on, as commercial intercourse between the various cities of the Mediterranean increased, it became the practice for vessels on long voyages, some of which occupied a period

of two or three years, to carry a magistrate on board, whose duty it was to administer the law among the merchants and sailors on board, not merely while the vessel was at sea, but also while she was lying in foreign ports loading or unloading cargo. This officer was designated by the familiar name of consul, and was the precursor of the resident commercial consul of our day.

No better name could have been devised at that age of the world. It indicated a magistrate of the highest authority, and gave to the person holding the office a standing and dignity in the eyes of the world well suited to the importance of the office.

At that early period of commercial intercourse, the merchant ships of all nations were held to be navigated under the jurisdiction of the nation whose flag they carried, and while lying in the waters and harbors of a foreign country they also enjoyed as complete exemption from the local territorial jurisdiction as though they were on the high seas, or within the harbors of their own country.

The same was true also of the ship's cargo, her crew and passengers. According to the theory of public law at that time, the laws of the nation to which an individual belonged followed him wherever he went, and he was entitled to their protection and benefit without reference to the laws of the territory or country in which he temporarily sojourned.

At the beginning of the tenth century the chief commercial cities of Italy and Spain, bordering on the Mediterranean, had become important centers of navigation and commerce, and occupied much the same position relatively as did the ancient commercial commonwealths of Thebes, Athens, Rhodes, and Corinth some ten centuries before. The whole of Italy was practically divided into the dominions of the various maritime cities of the Mediterranean and Adriatic, such as Amalphi, Genoa, Pisa, and Venice.

These cities formed a group of independent municipalities or republics, something like the free cities of Germany

some three centuries later. They were all essentially commercial, and were practically independent of any other power. Each of them in turn, beginning with Amalphi in the tenth, and ending with Venice in the fourteenth century, rose to a height of maritime and commercial splendor which we at this distance of time can scarcely realize. Macaulay, in speaking of this, says: "The moral and geographical position of the Italian republics enabled them alike to profit by the barbarism of the West, and by the civilization of the East. Their ships covered every sea; their mercantile factories and consulates rose on every shore. No other country of Europe, England excepted, has ever reached so high a point of wealth and commercial power."

We may form some idea of the maritime activities of the Italian republics and the magnitude of the commerce of that period when we remember that during the Second Crusade the Republic of Venice alone possessed a merchant fleet of over three thousand ships in the Mediterranean, employing many thousand sailors, besides a corresponding fleet of war vessels, manned by eleven thousand marines, which patrolled the Mediterranean from the Dardanelles to the Pillars of Hercules. As early as 1170 the Rialto had become the financial and mercantile exchange of Europe, just as London has become at the present time.

Anderson, in his Commercial History of Europe, says that at that time the merchant ships of the Mediterranean thronged the quays and harbors of Venice, Genoa, Pisa, and Marseilles, and that each of these cities maintained magnificent hotels, and mercantile clubs and guilds for the accommodation of the swarms of foreign merchants who flocked to these centers of commerce from all quarters of Europe and Asia Minor.

The extension of commercial intercourse among the Italian cities gave rise to a system of maritime and commercial usages which in the course of time came into general acceptance among them, and were gradually incorporated into their respective municipal laws and ordinances. These

laws, usages, and customs were in course of time collected, classified, and arranged. In other words, they were reduced to a regular code; but by whom, or at what exact period of time they were codified, we do not know. The name by which this celebrated code is known to us historically is the Consulato del Mar,—the Book of the Sea.

The codification of this great body of maritime laws and usages marks distinctly the era or beginning of consular establishments in Europe as they exist to-day, very much as the Peace of Westphalia, at the close of the Thirty Years War in Germany, is said to mark the beginning of modern diplomacy and international law. The code had its origin, undoubtedly, in the earliest practices of merchants and seamen, and was gradually sanctioned by the extending usages and customs of maritime commerce. The Consulato furnishes an eminently instructive illustration of the mode or method of evolution of international law. As before stated, the exact period of its origin is not known. Some suppose that it originated with the Pisans, because of its resemblance to the statutes of that city; others believe that it was the slow and gradual growth of the laws, customs, and usages of all the different maritime and commercial cities of the Mediterranean. All that we know with certainty is that it had been acknowledged and was in force at Pisa, Genoa, Marseilles, Barcelona, and Venice at the beginning of the thirteenth century. It is said that all the laws of neutrality, and of navigation and commerce of Europe and America, as they exist at the present time, have their foundation in the principles, maxims, and usages of the Consulato del Mar. It certainly contains the first clear and definite provisions in all history for the establishment of a foreign consular service.

The first eight chapters of the code are devoted exclusively to a definition of the functions, duties, and privileges of consular officers. It has been said that this fact of itself marks one of the most important eras in the history of commercial intercourse between independent nations. It

recognizes for the first time in the intercourse of nations the principle of consular representation abroad, and sanctions the most important official agency for the protection and promotion of foreign commerce and commercial interests ever devised or adopted by civilized nations. It sanctioned a principle and established a practice which had probably never before been perfectly comprehended or understood.

Previous to the adoption of the Consulato del Mar it had been customary to entrust the functions of the consular office to local magistrates residing at the port or city to which foreigners resorted for the purposes of trade. Under such a system a Roman consul or a Greek proxenus was a Roman or a Greek citizen residing at, and exercising the functions of his office in, his own country, city or town, and not abroad. He was a local municipal officer deputed to watch over the affairs and settle the mercantile and maritime disputes of foreigners and natives alike. Under such a system the consul, proxenus, or other consular officer, by whatever name he was designated, had no interest in foreign affairs, and no concern about the stranger within his gates, except that he was his judge, his advocate, or his proxy.

Under the system inaugurated by the Consulato del Mar, the consul resided abroad, and represented the interests of his country and watched over and protected the rights of his countrymen in a foreign land. He was distinguished from the local or municipal consuls of which we have before spoken in that he was the "consul beyond the sea," the consul of the stranger. Such an officer was not only the representative of the country which sent him abroad, but he was recognized by the nation to which he was sent. His office was, therefore, something more than national in character; it was international; because the officer occupied a recognized relation to both nations, and both nations had a direct interest in his official acts and conduct. To use the language of an old writer, a consul

became a "kind of ambassador, which one nation sends to the maritime ports of another nation, for the purpose of favoring the commercial interests of his own country and to settle the disputes of his countrymen in matters of trade and commerce."

In his different capacities such an officer was called upon to settle, not only the trifling disputes of sailors and of merchant traders, but to act at times in matters of the highest concern; matters on which depends alike the friendship or the hatred of governments.

The most interesting and probably the most authentic historical account of the Consulato del Mar in the English language is that given by Sir Travers Twiss in the supplement to the Admiralty Laws of Great Britain. He states that none of the ancient editions of this celebrated code have survived, and that the oldest edition now in existence,—a copy of which is still preserved in the National Library at Paris,—was published at Barcelona in the Catalan language in 1494, two years after Columbus first sailed for America.

In addition to the general regulations for the government of consuls, the Consulato del Mar also contained a collection of the admiralty and navigation laws, both of war and of merchant vessels; and "a collection of the ancient laws and usages of the sea in respect of freights; of damages to goods shipped; of the wages of mariners; of the public sale of stranded, damaged, or condemned vessels; of jettison; of commissions or bailments to masters and mariners; of wrecks and derelicts on the high seas, or washed on shore, and of all other contracts and matters declared in the usages and customs of the sea."

It is conjectured that the Crusades gave a tremendous impulse to the spread of consular establishments in Europe. These religious wars were largely instrumental in building up and extending the maritime and commercial intercourse of all the Italian cities at that period.

During the early Crusades in the eleventh century, over 300,000 Europeans suddenly forsook their homes to join

the standard of the cross for the subjugation of the Holy Land. The Christian army of the Duke of Lorraine alone counted over 80,000 infantry and 8,000 cavalry. An enormous fleet was necessary for the transportation of such large military expeditions to Palestine. The ships necessary for this purpose were supplied by the maritime cities of the Mediterranean, Pisa, Genoa, Marseilles, and Venice, from motives of gain. No English or German merchant ships had ever entered the Mediterranean at that time.

Rich and powerful as these cities had already become from maritime commerce, they now added enormously to their wealth by the fabulous sums of money which they exacted from the crusading nations of the West, not only for transporting their armies, but also for supplying them with the necessary military supplies and provisions of war. They also demanded and received from the Crusaders, as part of their compensation for these services, a practical monopoly of the trade with the East; and, among other things, they secured the important privilege of establishing permanent commercial and trading factories or depots at the various maritime ports and cities in Asia Minor and the Grecian Archipelago, in Egypt, and in Turkey; in fact, in all the great centers of Asiatic commerce. Not only so, but they also secured the still more important privilege of establishing permanent consulates, and of governing their merchant communities in such places by laws and ordinances of their own creation. By means of the several charters or concessions thus obtained, the Italian republics by the close of the twelfth century had established permanent mercantile communities or trading factories at all the ports and cities of the Levant, under the government of resident consular representatives. These establishments during the thirteenth century were still further extended by treaties, conventions, and capitulations with the Eastern emperors and the sultans of Egypt. These charters and capitulations granted to them the privilege of maintaining a Christian church, a counting house, and consular jurisdiction for the protection

of ships and the foreign merchants residing at each of these different factories or mercantile concessions.

From the chronicles of Pisa and Venice of that time we learn that as early as 1226 consular establishments were permanently maintained at Alexandria, at Aleppo, at Constantinople, and at all the various trading cities or centers of Asia Minor. In one of these old chronicles it is recorded that the consuls of the Italian and Catalan cities held a meeting or congress on one occasion in the historic church of St. Sophia in Constantinople,—for the purpose of formally acknowledging the Consulato del Mar as their common legal maritime and consular code.

Campany, in his history of the maritime laws of Barcelona, gives a copy of the instructions of the municipality of that city, issued in 1381, for the guidance of its consuls at Alexandria in Egypt, and at Damascus and other ports in Asia Minor. Before departure for his post of duty, the consul was required to subscribe a solemn oath of office to faithfully maintain and defend the rights of merchant vessels, and the honor of Catalan merchants and other Christian subjects of the King of Aragon within the jurisdiction of his consulate. He was particularly instructed on no account to let or lend the national factories or storehouses there to any Moor, Jew, or other infidel. He was directed to attend strictly to the disputes of merchants and sailors, and to make suitable visits of ceremony to the sultans and rulers of the country where he resided, and to communicate to such officers promptly all official complaints of his government. On visits of ceremony the consul was to be attended by an official suite, and at least two gentlemen ushers in livery. These early consuls were generally selected from a class of poor but well-educated gentry or noblemen. It was a proverb of that time that every Italian consul was a prince. The office was regarded as of the highest distinction and dignity, and was guarded by the different governments with the utmost jealousy. The consular system in those times was regarded, and justly so, as

the chief corner stone and greatest support of foreign commerce. No man was thought worthy of so important a trust who was not well versed in the principles of maritime and commercial law, the usages of the Law Merchant, and the forms, rules, and precedents of diplomatic negotiation. Indeed, at that time consuls were frequently entrusted with diplomatic duties and functions, as well as with the affairs of commerce; hence it was that those officers were frequently dispatched to their posts of duty in national vessels at the public expense, and were accorded many of the honors, rights and privileges which in modern times are granted only to ambassadors and public ministers.

The number and extent of consular establishments in southern Europe during the twelfth and thirteenth centuries may be inferred from the casual remark of Gibbon, that the Romans at that period of the Middle Ages would doubtless have restored the ancient appellation of consul, to designate their chief magistrates, "had they not disdained a title so promiscuously adopted in the Italian cities, that it has finally settled on the humble station of the agents of commerce in a foreign land."

While the consular establishments and commercial and maritime institutions of the Mediterranean world were in process of development, various institutions of a similar character were at the same time springing up in Northern and Western Europe. The most remarkable of these was that wonderful Confederation of the cities of Germany, commonly known as the Hanseatic League. This powerful maritime and mercantile confederation had its origin in the exigencies of early commerce. Like the Italian cities at an earlier period, many of the commercial cities of Germany had in the twelfth century become practically independent, or free cities, and, like trading towns in all ages of the world, their first impulse was toward a closer commercial union. In those rude times the German mariners had neither chart nor compass to guide their course, and were obliged to creep timidly along the shore to avoid the dangers

of the open seas. They had also to dread the more positive dangers of the Viking Pirates who infested the coasts of Northern Germany, and who regarded the peaceful trader as their lawful prey; just as the corsairs of Tunis and Tripoli did the merchant ships of the Mediterranean. For the purpose of mutual protection and safety, it became the practice for merchant vessels of the different German towns to make their trading voyages together in companies or fleets. The union thus begun on the seas was gradually extended to mercantile operations on shore.

When the German merchant fleets reached a foreign port they frequently found it necessary to remain there for months, and even years. The conditions of trade and commerce made it necessary for the merchants to employ or rent storehouses on shore for the convenience of storing and exchanging their goods, and also suitable quarters to live in. In the course of time, as trade and commerce increased, it became common to establish permanent storehouses at foreign ports; a sort of common depot for the storage and safekeeping of the goods and merchandise of the company. These were called mercantile factories, and formed the central points of the great union or Hansa. Around these factories the German merchants clustered in little communities, by themselves, for the sake of safety and for social reasons, in places or streets set apart for them. In London, for instance, where the Hanseatic factories were established, they occupied the districts now known as Bishopsgate, and later also Billingsgate.

During the twelfth and thirteenth centuries the League established a system of confederated mercantile factories and consulates in more than eighty different cities of Northern and Western Europe, extending from Novgorod and Moscow to Holland, France, and the British Isles.

During all of this period the League enjoyed a corporate constitution. In short, it was a huge mercantile and political corporation, and finally resolved itself into a gigantic commercial trust, and completely monopolized and

controlled the maritime trade of Western and Northern Europe, very much in the same way that the Italian cities monopolized the trade and navigation of the Mediterranean.

Wherever the Hanseatic factories or mercantile settlements became established it was neeessary to form some sort of civil government among them; for at that time no such thing as modern international law existed. Foreign settlements were permitted to govern themselves independently of the territorial sovereign as best they could; and in much the same way as the mercantile factories or settlements in the Levant formed consular governments, these Hanseatic merchants organized similar institutions at eaeh of their settlements. The manner in which the Hanseatic League appointed their consular officers and organized these consular governments differed somewhat in detail from that of the Italians, but in all their essential features the system was the same. Instead of selecting the consul from among the gentry and noblemen, the Hanseatic merchants elected one or two of their own numbers to perform the functions and duties of the consular office.

From the thirteenth to the sixteenth century the Hanseatic League was the most powerful mercantile, maritime, and political organization in Northern Europe. It maintained a chain of nearly one hundred consulates for the protection of commerce and trade, extending to all the commercial cities of Northern and Western Europe, from the Baltic to the Rhine. Their system of consular jurisdiction and government was similar to that of the Italian republics in the Mediterranean. Both systems of commercial jurisprudence had many elements in common, and it is believed that the admiralty laws and consular institutions of both were formed on the same common model. Taken together, the two systems may be said to constitute the historic background, and to have supplied all the fundamental principles of the modern consular systems of the world.

From a charter still in existence, granted in 1404, King Henry IV secured for British subjects the rights of consular

representation and protection in all the Hanseatic cities in Germany. Thirty-four years later a treaty was negotiated between King Henry VI and the consuls of the Teutonic Hansa, "renewing all the English consular privileges for one hundred years backwards, in commercial and nautical affairs"; and fully confirming the authority of British consuls to "do justice between the King's liege subjects and merchants at all the Hanseatic towns beyond the sea."

One of the most interesting facts in connection with consular history is, that by the terms of the English treaty of 1438 it was agreed that thereafter the laws and ordinances of the Consulato del Mar should be strictly observed in all matters pertaining to consular jurisdiction at the Hanseatic ports.

In 1485, while Christopher Columbus was probably supplicating the court of Ferdinand and Isabella for ships and money for his voyage of discovery, Richard III of England commissioned Lorenzo Strozzi, a Florentine merchant, as British consul at Pisa. This commission, which is now 416 years old, is still preserved in the archives of the British Foreign Office in London, and is believed to be the oldest original copy of any consular commission in existence. It is written in Latin, and was signed by that unhappy king only a few months before he fell on Bosworth Field. It grants to the consul, in lieu of salary, one-fourth of one per cent. of all the goods and merchandise imported or exported by English merchants at Pisa.

The main historical value of this venerable piece of parchment consists in the remarkable sentence with which it closes, namely, "The said Lorenzo Strozzi is hereby empowered to exercise all the usual powers and enjoy all the rights and privileges which other consuls hath formerly enjoyed there or elsewhere."

From this period forward, as international commerce increased, it became more and more common among the commercial nations of Europe to maintain consular establishments at all the maritime ports of each other. By

degrees, as the utility of consuls became more apparent, the practice became general among commercial nations to regulate and define by special treaty stipulations the extent and manner of exercising consular jurisdiction among them.

When we come to examine the consular system of the United States, and especially the provisions of our different consular treaties with other nations, we shall see that nearly all the fundamental rights, powers, and duties of American consuls are derived from the ancient usages, ordinances, and customs of European countries, and that the consular service of the United States is borrowed from and modeled after the consular institutions of Europe.

The various consular treaties and conventions of the United States, and the laws of Congress enacted for the purpose of carrying them into effect, will be specially noticed hereafter, when we come to discuss the history and organization of our consular service.

HISTORY OF THE UNITED STATES CONSULAR SERVICE.

The consular system of the United States originated and had its early development during the decade immediately following the Revolutionary War.

At the beginning of our political existence our intercourse with foreign nations related almost exclusively to questions of a diplomatic character. We had little foreign commerce, and consequently little need of a consular service.

The way in which our consular service grew up will best be understood by a brief account of our early diplomatic intercourse. Within two months after the Declaration of Independence a diplomatic mission was dispatched to France by Congress, with Benjamin Franklin, the father of American diplomacy, at its head. The first duties of the American commissioners consisted in negotiating treaties of amity and commerce with European nations, in borrowing

money to carry on the war, and in establishing, as best they could, our national credit abroad.

The powers given the commissioners were indefinite. They were instructed to negotiate treaties, to purchase military supplies, to borrow money, and to take charge of the political and commercial interests of the United States generally. In short, to do whatever the interests of the country seemed to require. These activities involved the exercise of both diplomatic and consular powers. At first there were few consular duties to perform, as we had as yet little or no foreign trade; but as our political and naval relations with France became more intimate, attention to such duties became more frequent and necessary; American seamen in particular required attention; and so in the course of time our diplomatic agents, or commissioners, were obliged to exercise consular functions, as well as diplomatic duties. The whole business of our foreign relations was thus included in the same service, and both duties were performed by the same officers.

It has been remarked that American diplomacy may be termed, altogether, of a commercial character; at least, its legitimate origin being in commerce, our treaties for the most part, have consisted of arrangements for the regulation of trade, navigation, and commerce.

The War of the Revolution was itself, in a large measure, connected with commerce. The various treaties between the United States and the powers of Europe, by which our national independence was recognized, mark an epoch in the diplomatic and commercial relations of civilized nations, in that they are the first to convert diplomacy exclusively to purposes of commerce. The basis upon which these treaties were negotiated on our part is worthy of the most serious study as embodying the principles which lie at the foundation of our diplomatic intercourse with the nations of the world. The provisions of the first treaty of amity and commerce between the United States and France, negotiated by Franklin and concluded on the 6th of February, 1778, are especially deserving of attention.

That treaty is believed to be the first instance, in the diplomatic record of nations, in which the true principles of all fair commercial negotiations, between independent states, were laid down and proclaimed to the world.

"That Treaty," says the author of the American Diplomatic Code, "was to the foundation of our commercial intercourse with the rest of mankind, what the Declaration of Independence was to that of our internal government. The two instruments were part of one and the same system; matured by long and anxious deliberation of the founders of this Union, in the ever memorable Congress of 1776; and as the Declaration of Independence was the foundation of our municipal institutions, the provisions of the treaty with France laid the cornerstone for all our subsequent intercourse with foreign nations."

This remarkable state paper, which contains a statement of nearly all the principles which have since governed the United States in their intercourse with foreign nations, among other things declares: "The Most Christian King of France and the thirteen States of the United States of North America, willing to fix in an equitable manner the rules which ought to govern the correspondence and commerce between their respective countries, have agreed that * * * * the two countries shall mutually have the privilege of maintaining consuls, vice-consuls, and commissioners of commerce, in the ports of the other, whose functions, rights and privileges shall be regulated by a 'particular agreement.'" The particular agreement for regulating the powers of consular officers of the two nations respectively was not finally perfected until 1788, ten years after the ratification of the treaty of commerce.

The first step taken towards introducing some system into the foreign service was a joint resolution of Congress in 1785 declaring that it was expedient that the United States should appoint consuls abroad, and "that the Ministers of the United States in European countries are empowered and authorized to exercise the powers of consuls

general in the countries to which they are accredited, provided, however, that no additional salary shall be allowed them for such service." This resolution, while it definitely recognized the consular service, in no way defined the duties or powers of consular officers; it simply recognized the existence of the system, and nothing more. The system, however, if it may be called such, was not only a very crude one, but it was distinctly a defective and poor one, because it failed to give the consular service an organization separate and distinct from the diplomatic service; and because it placed the management and control of the consular service in the hands of our foreign ministers, instead of one of the executive departments at Washington. In thus uniting the two branches of the foreign service Congress not only acted unwisely, but it also totally disregarded the recommendations of Franklin and Adams. Mr. Adams, in criticising this action of Congress, said, "My idea is this: Separate the office of public minister entirely from that of consuls and commercial agents. By blending the business of a diplomatic office with that of a consul, the administration of our diplomatic and commercial affairs becomes so confounded with each other, that I am sure no satisfaction can ever be given to the public in the disposition of its foreign affairs."

Franklin also wrote about the same time that merchants and captains of American vessels were continually writing to him for his opinion and advice, or for orders, or for leave to do this or that, "so that much valuable time is lost to them, and much of my time is taken to little purpose, on account of my ignorance of consular affairs and duties."

Washington also recognized fully the necessity of organizing a consular service independent of the diplomatic corps. In one of his early messages to Congress he said, "The patronage of our commerce and of our merchants and seamen calls for the appointment of consuls in foreign cities. It seems expedient to regulate by law the exercise of that jurisdiction and those functions which are permitted

to consuls, either by express convention or by a friendly indulgence, in the place of their residence."

There can hardly be a doubt that a strong, independent, and efficient consular service at that period of our national history would have been of the highest value in restoring the foreign commerce of the country, which had been completely paralyzed by the war with England. Unquestionably, a good consular service at that time would have also helped American merchants greatly in developing a trade with other countries than England; and it is quite possible also that the British government at that time might have been induced to withdraw the vexatious restrictions which it so long continued to impose upon our trade, had there been an energetic body of American consuls in England to set forth intelligently the advantages to both countries of an unrestricted trade.

At the close of the Revolutionary War our commissioners in Europe had already negotiated treaties of amity and commerce with France, Holland, Prussia, and Sweden; and each of these treaties contained a provision similar to that already mentioned in the treaty with France, stipulating that the functions and powers of consuls should be regulated thereafter by a particular convention for that special purpose.

The first nation with which we concluded a special consular convention, in pursuance of this arrangement, was France. It was signed by Thomas Jefferson and the Plenipotentiary of France, on the 14th of November, 1788. It was by far the most liberal consular treaty, and gave to the consuls of the two nations respectively more extensive powers, privileges, and jurisdiction than had ever been granted before by any treaty. With a few slight modifications, it has served as the model for every consular convention which the Government of the United States has made since that time. At the time it was first published it attracted the attention of all Europe on account of its advanced and liberal provisions in regard to the exercise of consular rights, duties, and privileges.

Although this convention bears the signature of Thomas Jefferson, and was in fact negotiated by him while Minister to France, the originator and author of all its essential provisions and principles was Benjamin Franklin. Four years before that date, while Franklin was yet Minister to France, he had negotiated with that government a special consular convention, which had failed of ratification by Congress. It is a singular fact that Jefferson, Washington's first Secretary of State, was opposed to a consular treaty altogether, and thought we were better off without any. The diplomatic correspondence and the debates in Congress relating to our consular treaty with France form altogether one of the most instructive and interesting chapters in the history of modern consular systems. It is worthy of note here that when the treaty was transmitted to Congress for ratification, Jefferson—who had at that time returned from France and had been appointed Secretary of State by Washington,—urged the enactment of a law by Congress giving consuls a fair salary, prohibiting them from engaging in trade while holding a consular position, and restricting all the principal consular appointments to native born American citizens;—an eminently sound and sensible suggestion which Congress had not the wisdom to adopt. The minor offices, such as consular agents and vice-consuls, Jefferson thought, might be given to the best subject residing at the port, whether alien or citizen. Had Congress adopted the suggestions of Franklin and Jefferson in its legislation for carrying the French treaty into effect, our consular service for the next fifty years might have been a boon to our foreign commerce and a benefit and a credit to the nation.

The act passed by Congress in 1792 for carrying into effect the consular convention with France was the first law of the United States which professed to organize a consular service. The act did nothing more, however, than simply to recognize the existence of the service, to impose upon American consular officers certain specified duties, and to

provide a schedule of fees which they were entitled to collect for their official services. It gave them no salaries whatever; it in no way defined the extent of their powers or the duties to be performed by them; it imposed no qualifications for the office, and gave the service neither character, standing, nor dignity. The appointment of consuls was left entirely to the discretion of the President, unregulated and unhampered by any legislation or restriction, save by the general restrictions imposed by the Constitution.

For the next thirty years the only consuls for whom salaries were provided by law were those at Tangiers, Tunis, and Tripoli, in the Barbary States of the Mediterranean; and these provisions were forced upon Congress by reason of our political relations with those piratical powers. Such other consuls as the President saw fit to appoint received no salaries from the Government, and were paid for their services, if paid at all, by the fees of their offices. Long afterwards provision was made by Congress for small salaries for our consuls at London and Paris, and these two offices for more than thirty years were the only salaried consulates of the United States in any civilized country. As late as 1853 there were but ten salaried consuls in our entire service. The saving clause,—the salvation, so to speak,—of the service during the first half-century of our national life was that our Presidents, following the traditions of the British foreign service, confided the administration of the consular system exclusively to the Department of State.

The Department of State was among the earliest of the great divisions of the national administration, created by Congress in 1789, for facilitating public business, after the adoption of the Constitution. It has always ranked as the leading department of the Government. The Secretary of State is the only member of the Cabinet who in ordinary times can influence, not only the foreign policy of the Government, but also the peace and welfare of the nation,

without the permission of Congress. By the negotiation of a treaty he may, if the moment be well chosen, draw the country into a foreign complication or engagement, from which it would be extremely difficult to withdraw with national honor and credit; or he may inaugurate a new and possibly beneficial commercial policy. By hasty action, by an intemperate or ill-timed insistence on national or individual rights, by even a want of tact or a hasty word, he or his agents abroad and under his control may arouse the anger of a foreign nation, hard to be appeased, and thus embroil the country in a political quarrel, or possibly bring upon us a foreign war. The Secretary of State is, therefore, by reason of his influential position and power, more carefully selected than any other member of the President's Cabinet. He is generally a ripe statesman with a large acquaintance with public affairs, and in many instances has had wide experience in the diplomatic service of the country. A department habitually controlled by a man of such character and experience is pretty certain to exercise unusual watchfulness and care in the selection of the public agents which it sends abroad, and in the management of its affairs; and such, indeed, is the traditional history of our Department of State.

For the convenient dispatch of business the State Department is divided into several bureaux. Of these the Consular Bureau and the Diplomatic Bureau are the most important. Ever since the organization of the State Department the Consular Bureau has been under the direction and immediate control of one of the Assistant Secretaries of State,—usually the Third Assistant Secretary,—following in this respect the traditions and practice of the British Foreign office, where the consular service is controlled by one of the permanent under secretaries. Unlike the English civil service, our own is not permanent; but as far as circumstances would permit, our Department of State has made few changes in its assistant or under secretaries. Mr. Hunter, for instance, was Third Assistant Secretary,

and had charge of the Consular Bureau continuously more than fifty years. It is greatly to the credit of the department that in our changing service it has uniformly recognized the need of experience and special knowledge in conducting the Consular Bureau.

The routine business of the Consular Bureau is conducted, of course, in much the same way as in other departments of the Government and as in the foreign offices of European countries.

The Chief of the Consular Bureau is, perhaps, the hardest worked and poorest paid official in the whole department. He occupies a public room, accessible to everyone who chooses to call upon him on any matter of business connected with his department. He carries every detail of the department in his head. He is a living and walking encyclopedia of all knowledge relating to the consular service. He makes it his business to know all that is knowable about every United States consulate in the whole world, even to the smallest details and conditions of the office. With few exceptions, he is personally acquainted with every principal officer in the consular service, and he often knows more about them officially than the consuls imagine. He has long official ears, and a still tongue. He listens patiently and politely to every complaint and to every application for advice, whether made to him personally or by letter, and returns a civil answer; but he seldom imparts much real information, and never volunteers unsolicited official advice. He is habitually courteous and polite, both in his personal intercourse and in his official correspondence, and is always cautious, careful, and politic. He is at once the model and the quintessence of American official propriety and courtesy, and two hours of personal intercourse with him in his office is worth more to a young, inexperienced consul than all the books on official etiquette ever written.

The most glaring defects of the consular service as they afterwards developed under the act of 1792 were that no

special qualifications or fitness for the office and no civil service examinations were required. Neither age, nationality, educational qualification, nor special training of any sort were made necessary qualifications by law for appointees to consular positions of any grade, from the highest to the lowest; no official gradation of the consulates was provided for, and the greater number of consular positions were filled by persons who were permitted by law to engage in trade at the ports where they exercised the duties of their office, and many of them were foreigners. Instead of fixed salaries, our consuls were allowed to retain a certain amount or all of the fees collected by them for official services performed. Under such a system the official fees of the consul were the only emoluments of his office; consular fees were called "perquisites," and at ports where there was a large American trade the perquisites of the consular office frequently amounted to as much as or more than the salary of the President of the United States. At Liverpool, for instance, the consular fees at one time amounted to more than $25,000 a year; at a number of other consulates also the fees amounted to $10,000 or over annually.

It followed as a natural consequence that in course of time these fat offices abroad came to be eagerly sought after as political prizes or rewards for political services to the friends of the party in power. It came to be an accepted American maxim that "to the victor belong the spoils," and after a while Congressmen came to regard consular appointments as a legitimate means of rewarding their partisan friends for past services. In short, under the "spoils system" our consular service became a large political prize lottery for the benefit of the party in power.

Moreover, it resulted that at foreign ports where there was little American trade, and where there were consequently few fees or perquisites of office, it became almost impossible to secure the services of an American of character to fill the consular office; and in any event, the person

selected, whether American or alien, was almost certain to be engaged in trade at the port or place where he exercised the duties of the office. A consul should have no commercial engagements. When a consul is a merchant it is only natural that he should be more attentive to his own private business than to the interests of the Government or of the citizens of the country which he represents. He is likely to be engaged in that business which has the chief export trade of the country he represents, and by reason of his official position he has the power of becoming acquainted with the private business of the merchants exporting the same class of goods. In this way he may,—and experience shows that he usually does,—so use his official position and the special knowledge derived from it as to benefit his own business, to the serious detriment of other merchants engaged in a similar business.

The principal commercial countries of Europe, which have carefully studied the needs of their consular service, and which understand the importance and the value of consuls to foreign commerce, have long since abandoned the system of employing unsalaried consuls, or of allowing them to retain their fees or to engage in trade at the ports where they reside.

Numerous attempts were made by our Presidents and Secretaries of State, for a period of over sixty years, to induce Congress to reorganize the consular service and place it on a footing of efficiency and dignity suited to the requirements of our national interests. The most notable effort in this behalf, perhaps, was that of Edward Livingston, the Secretary of State under President Jackson in 1833. Mr. Livingston's report, which was transmitted to Congress by President Jackson, is one of the ablest state papers in existence regarding the requirements, defects and history of our consular system. He clearly pointed out that in none of the various acts of Congress for carrying into effect our consular conventions with foreign countries had the rights, duties and privileges of consuls been accu-

rately defined, and that for nearly fifty years the consular service had been left almost exclusively to the government and control of the State Department, without a single enactment of Congress suitably empowering the President or the Secretary of State to direct consuls in the performance of their important duties abroad. It was not until 1856 that the service was finally organized upon its present basis. It is remarkable that at the time this law of 1856 was enacted our ocean commerce and mercantile marine had nearly reached, in point of tonnage, that of Great Britain, and that our foreign carrying trade greatly exceeded that of any other commercial power in the world. Some idea may be formed of its magnitude at that time when we remember that a few years later, during the Civil War, our merchant marine furnished seventy-six thousand sailors to man our blockading squadron on the Atlantic Coast of the Confederate States.

It was the aim of the act of 1856 to reduce the consular service to a regular system, somewhat in line with the British consular service, which had been reorganized by Mr. Canning in 1825; by providing for fixed salaries at all the principal consulates, and by requiring the return to the Treasury Department of all consular fees collected at such offices. The consuls at places where the fees were inconsiderable and the work light were to be compensated by the fees of the office as before. The act entirely failed, however, to correct the radical and really serious defects in the established system.

Since that time several other attempts at reorganization have been made by Congress, notably that of 1874, when the system was considerably modified; but none of these acts have gone further than to give it the stereotyped form of such services in other countries. The form is there, but the spirit and substance are still wanting. As at present organized, the service consists of the usual consular gradation or classification; that is, consuls general, consuls and commercial agents. In addition to these there are deputy

consuls, consular agents, deputy and vice-consuls and thirteen consular clerks. Deputy and vice-consuls are not, under our system, full permanent consular officers, and perform no functions except in the absence or during the disability of their principals. While in charge of the consulate these officers for the time being perform the duties and draw the salaries allowed to their principals, and all their acts have the same force and validity as though they were permanent officers.

Our consuls general, although they outrank the consuls, perform precisely the same duties at the ports where they reside as ordinary consuls. In this respect our service differs from that of most other countries, which usually maintain a consul and consul general at the same port.

Our consuls general, in addition to their ordinary duties as consuls at the place of their residence, are charged with an indefinite kind of supervision over the different consulates within the limits of their jurisdiction. They are given a general oversight over consuls subordinate to them, and are required to report to the State Department, from time to time, in regard to the service generally within their districts. The authority of consuls general over the consuls under them is, in fact, very limited, and relates for the most part to official suggestions or advice. They have no authority to investigate a consul's books or to control his official acts or to interfere in any way with his official correspondence and conduct, without special authority from the State Department.

Several of our ministers resident abroad are also consuls general, namely, those at Corea, Liberia, Persia, Servia, and Siam, and at two or three of the South American republics. At Constantinople the Secretary of Legation is also consul general. These, however, are usually classed with the diplomatic service. Our consul general in Egypt is also a political agent. His office is partly consular and partly diplomatic in character.

In countries where we have no consul general with

supervisory powers over the consulates, the United States Ministers resident in the country are given a general oversight of them. And in all foreign countries our diplomatic representatives exercise the same supervision over the consuls general that consuls general exercise over the consuls under them. The United States Consul General in Cuba is directly responsible to the State Department. In China, owing to the peculiar conditions of the country, our consuls are required to communicate immediately to the American Minister at Pekin an account of every event of importance affecting American interests, and to furnish him a monthly summary of all their correspondence with the local Chinese officials.

The district embraced within the jurisdiction of consular officers of all grades is defined by the President of the United States. The consular commission usually describes the limits of the consular district as embracing all places nearer to the official residence of the consul than to the residence of any other consul within the same country.

All consuls general, consuls, and commercial agents of the United States are appointed by the President, by and with the advice and consent of the Senate. Consular agents are commissioned by the Secretary of State.

The salaried consular officers are divided into different classes or grades, according to the amount of salary allowed, ranging in amount from $4,000 to $1,000. In respect to their powers and duties, however, there is no difference between them; for all legal purposes the lower-grade consuls have the same powers and perform the same duties as consuls of the higher grades. They are each and all alike in legal contemplation "full permanent and principal consular officers of the United States"; the only difference between them being the amount of salary.

As no law has ever been enacted permitting consuls to be promoted to a higher grade, this classification is practically meaningless, except to define the salaries at different ports. In all the higher grades the consular officer is not

permitted to engage in trade, and must be a natural born or naturalized citizen of the United States. In the lower grades, where the salaries are insufficient to support the consuls, they are allowed to retain their fees and engage in trade.

What corresponds to the vice-consul in the service of European countries, is called in ours a consular agent. He is under the immediate control of the consul, but stationed at a place or port within his consular district, at some distance from the main consulate, to which he is subordinate. The duties of a consular agent in our service, although substantially the same as those of a full consul, are performed, not as a full consular officer, but as the agent of the consul and in subordination to him. Consular agents are, therefore, not entitled to correspond directly with the Department of State, but only with their principals. A consular agent is not entitled to receive an exequatur, but acts under the exequatur of his superior. The office of commercial agent is peculiar to our service, and has not heretofore been recognized by the Law of Nations, although by the laws of the United States their acts are fully recognized as those of a full consular officer. The title of commercial agent originated in the practice of our Government of appointing an officer to perform consular duties at ports where no provision had been made by Congress for consular salary, and which enabled the President to appoint such an officer without the consent of the Senate.

Broadly speaking, our consular service at present consists of 41 consuls general, with salaries ranging from $7,500 to $2,000; 160 salaried consuls who are not allowed to engage in trade, with salaries ranging from $4,000 to $1,500; and 20 consuls with salaries of $1,000, who are allowed to engage in business. Besides these there are about 80 consuls, 40 commercial agents, and 390 consular agents who receive no salaries, and are allowed to engage in trade, and who are authorized to retain their official fees in lieu of

salaries. There are also 13 consular clerks, making in all between 700 and 800 officers in the entire consular service.

It is a singular fact that the consular clerks, who stand at the foot of the service, are the only officers in the whole foreign service of the United States whose tenure of office is permanent, or during good behavior. The original design in creating the office was to form the nucleus of a permanent consular service. They were at first called consular pupils, after the French system. These consular pupils, or clerks, after a limited experience in the Department of State, where they acquire a great deal of useful knowledge of the service, are assigned for duty at those consulates at which, in the opinion of the Secretary of State, they will prove most useful. They may be transferred from time to time, also, to different posts. The law expressly provides that no consular clerk shall be removed from office, except for cause stated in writing and submitted to Congress; and it is a noteworthy fact that no consular clerk in our service has ever been removed for cause since the office was created. Several of them have been promoted to the office of consul; one or two have resigned, and two of them have regularly risen in the service to the position of consul general. It is a great pity that Congress does not provide for a greater number of these consular pupils, for if it did so there would be but a short time until our consular service would be greatly improved by the system.

As soon as a consul has been regularly notified of his appointment, he is required to execute and file with the State Department an official bond, and to subscribe an oath of office. He is then allowed thirty days in which to prepare himself for his duties and to receive his instructions from the Department, during which time he is allowed his full salary. As a rule, the only instructions which a newly appointed consul receives before leaving for his post of duty consist of the ordinary printed instructions contained in the Consular Regulations of the Department, a copy of which is given him with his commission and official passport.

While in attendance at the Department of State the consul should make the acquaintance of his immediate superiors in office, the Third Assistant Secretary of State, and the Chief Clerk of the Consular Bureau; and he will, of course, not fail to call upon the President and thank him for his appointment. It is customary for the Secretary of State to take the consul to the Executive Mansion and introduce him formally to the President, before he leaves Washington for his post of duty.

It may seem a matter of trifling moment, but it should never be forgotten by a newly appointed consul that the first impressions which his personal demeanor and bearing produce upon his official superiors at Washington go a long way toward establishing him in their favorable or unfavorable opinion.

While receiving his instructions, a consul should run carefully through the correspondence with his predecessors in office on file at the Department, in order to make himself familiar with the former history and business of the consulate. Above all, he should obtain from the State Department an official copy of all existing treaties between the United States and the country in which his consulate is situated. The rights, privileges, powers, and duties of consuls differ materially in different countries. These matters are for the most part defined and regulated by special treaties or conventions. The United States has at present fifty-two separate consular treaties with the different countries of the world. Before a consul enters upon his duties, therefore, he should be perfectly familiar with all the treaty provisions between the country to which he is accredited and the United States, relating to consular duties, rights, and powers, as well as those relating to navigation, commerce, and trade between the two countries.

By the provisions of some of our treaties, consuls are invested, in addition to their ordinary functions, with extensive judicial powers and privileges, as in Turkey, Morocco, Persia, China, and Corea. In many countries our

consuls are entrusted by treaty provisions with certain duties in relation to the extradition of criminals, and the right to claim deserters from vessels of the United States. In most European countries our consuls are in like manner invested with exclusive jurisdiction over the disputes between the masters and crews of vessels of the United States, over the estates of American citizens dying abroad, over shipwrecks and shipwrecked property, and various other kindred subjects. Before proceeding to his post, therefore, a consul should specially inform himself regarding the details of every treaty provision with the country to which he is accredited, relating to all these important subjects.

After his arrival at his post abroad, and before entering upon the discharge of his duties, a consul must first obtain his exequatur, that is, the official recognition of the government of the country to which he is sent, or its consent that he may perform his official duties. It is a rule of International Law that no public officer of one nation can perform his duties within the dominions of another country without the consent of the government of that country. All governments have the right to refuse to recognize a foreign consul, on the ground that he is personally or politically objectionable. The government of Turkey, for example, has frequently refused to issue exequaturs to American consuls, on the ground that the officers appointed were Christian missionaries. The government of Austria on one occasion refused to recognize one of our consuls, on the ground that he had been an Austrian subject, and was personally objectionable to the country on account of his political writings.

It is a rule among European governments to inquire minutely into the personal and political antecedents of foreign consuls before permitting them to enter into official relations with them.

A consular exequatur may also be withdrawn or cancelled at any time by the government which issues it, for any misconduct or act of official discourtesy on the part of

the consul in his intercourse with the government, or for writing obnoxious political articles, or making offensive political speeches, or any such conduct. On one occasion the President of the United States cancelled the exequatur of the French Consul at Boston because he took part in an attempt to rescue a French vessel from a United States marshal. A more remarkable case was that of Mr. Bunch, the British Consul at Charleston, in 1861, who, at the instance of his own government, entered into a political correspondence with the Confederate Government. The act was a violation of the laws of the United States; and although it was done at the instance and under the direction of the British Government, President Lincoln cancelled the consul's exequatur, and refused longer to recognize his commission.

In diplomatic usage an exequatur signifies a written document authorizing a foreign consul to execute the duties of his office within the district of his consular dominion.

After receiving his exequatur, the consul then applies to the officer in charge of the consulate for possession of the consular seal, and the archives, and all public moneys and other property belonging to the consulate. A formal inventory of these is made and a receipt given by the incoming to the outgoing officer. If there are any public funds in the hands of the former incumbent of the office, or if there is any property belonging to the estates of deceased American citizens, these must be handed to his successor.

Having taken possession of the office, and entered upon the discharge of his duties, the consul must immediately give notice of the fact to the Department of State, to the United States Minister, and to all American consular representatives in the country where his consulate is located. He should in like manner officially notify the local authorities and each of the different consular representatives of other nations at the port, with whom he is likely to have official relations in future.

THE DUTIES, FUNCTIONS, RIGHTS, AND PRIVILEGES OF CONSULS.

The first duty of a consul on taking charge of his office is to call in person upon all the principal military and civil authorities at the place where he is to reside. The list of calls should include, not only the leading local officials, but also the various consular representatives of other nations, and the heads of the different chambers of commerce and boards of trade; in fact, everyone with whom he is likely to come in contact in the performance of his official duties. These calls of ceremony are not only a convenient means of official notification, but are necessary acts of courtesy which no officer in the foreign service of his country can afford to neglect.

The newly arrived consul, if he hopes to get along smoothly in his official duties, will not neglect also to put himself as soon as possible on easy terms of social intimacy with all the leading representative citizens, as well as the officials of the place where he resides. It is a part of a consul's duty to make his country not only respected, but liked, abroad, both by the governing classes and by the people at large, to promote among them a sentiment of good feeling for his countrymen. To this end his own personal popularity is of the utmost consequence. Moreover, one of the greatest aids to a consul in the performance of his duties, is to be on terms of personal intimacy with the officials and people where he resides. The significance of official and social amenities which pass between our consular and diplomatic representatives and the local officers and leading people of the country where they are sent is often misunderstood and is sometimes misrepresented. From time to time we hear expressions in this country about our foreign representatives "toadying" to the official or aristocratic classes abroad. Such expressions are generally not only

uncalled for, but are exceedingly undignified. Great nations do not toady to one another, for such acts imply servility. Acts of official courtesy are entirely devoid of personal significance; they are simply meant as an expression of that international good feeling which it is the highest duty of every consular and diplomatic officer of the United States to cultivate.

After a consul has made the round of ceremonial calls and has, perhaps, enjoyed the agreeable hospitality of the local officials and the foreign consuls at his post, he is apt to settle down to the everyday duties of his office with a sense of lonely responsibility. He finds himself suddenly called on to perform a number of official acts in relation to commercial transactions and dealings, the details of which he is probably wholly unfamiliar with. A variety of questions connected with foreign trade, navigation and shipping, immigration, and naturalization, involving vast public interests or valuable personal rights, demand his immediate attention and call, perhaps, for prompt official action. He is far beyond the reach of the advice or control of his government; he has no legal counsel within reach or at his command, and has absolutely nothing to guide him in the discharge of his delicate and important duties but the few rules laid down in his official instructions. In almost every other branch of the civil service, there is some clerk or other subordinate official who has been long enough in the office, and who has had sufficient experience, to be able to conduct the routine business and to advise his newly appointed chief in the ordinary course of procedure until he becomes acquainted with the details of the office. Under our changing system of appointments, except at a few of the leading consulates, there are usually no permanent subordinate officers, and the newly arrived consul suddenly finds himself, not only entirely ignorant of the simplest routine duties, but without the assistance of anyone who is familiar with them. It is his first business, therefore, to master the details of his office, and to familiarize himself with the local

conditions, customs, and requirements of his post. To do this he should begin systematically to inform himself accurately in regard to the local laws and regulations relating to the customs, harbor, and lighthouse dues, the quarantine regulations, and all matters relating to the foreign and domestic trade, commerce, and navigation of the district and country where he is located.

There are two fundamental principles governing the powers and duties of consuls which every consular officer should keep constantly in mind. The first is, that among civilized nations a foreign consul can legally exercise no judicial functions whatever, nor perform any act of a judicial character, without the consent, by treaty stipulation or otherwise, of the government of the country to which he is sent. The second is, that no act which a consul can perform, whether judicial, administrative or otherwise, has any validity in law unless authorized by some legal enactment of the government which he represents.

I have before said that every consul, before starting for his post of duty, should make himself thoroughly familiar with every detail of the treaty between the United States and the country to which he is accredited. It may be said that the various treaty agreements, and the laws of the United States enacted for the purpose of carrying them into effect, form the American Consuls' Horn Book. No amount of "instructions" from the State Department, however specific, could be of much service to a consul who is really ignorant of the treaty obligations and treaty rights of his country. If he understands these thoroughly, he is not likely to go far wrong in the discharge of his duties; but if he does not, the probabilities are that sooner or later he will become involved himself, and may needlessly involve his government also, in some unprofitable dispute with the local authorities or with the country in which he resides.

In the various duties which a consul is called upon to perform on behalf of his countrymen or in relation to the commercial interests of the nation at large, he may, if he is

ignorant of treaty provisions and requirements, assume a position or claim a right highly injurious to our interests; or he may, from the same ignorance, refuse or neglect to assert a right or to claim a privilege, where the case demands the most prompt and vigorous action. In most of these circumstances, as before stated, a consul has practically nothing to guide him but his own knowledge and good sense; and if he is ignorant or ill-informed, especially in regard to the treaty rights and obligations of his country, he may jeopardize, or even sacrifice, the most important individual or national interests. At home every officer is surrounded with the means of obtaining information and advice; abroad a consular officer is entrusted with the most important and delicate duties, and is out of the reach of control or advice. The importance, therefore, of a clear and definite comprehension, on the part of consuls, of the treaty rights and obligations of their country can hardly be overstated. The Department of State must necessarily trust in all such matters to the knowledge, intelligence, and discretion of the consul, on the one hand not to permit the rights of his country or of his countrymen to be invaded without protest, and on the other hand not to claim rights which cannot be maintained.

There are numerous circumstances which render it not only proper, but absolutely necessary, for consuls to act on behalf of their country in matters of a diplomatic character, especially in the absence of the American Minister. In many European countries the right of consuls is secured by treaty to correspond with the local authorities in case of any infraction of treaty; and in case there is no American diplomatic representative in the country, they may correspond directly with the government of the country in which they reside.

With some countries the United States has secured by treaty the right of consular officers, in the absence of our diplomatic representative, to make official requisitions on behalf of our government for the surrender of fugitives

from justice, under our extradition treaties. The right to take depositions is secured to our consuls by a number of conventions. Exclusive jurisdiction for consuls over the disputes between masters, officers, and crews of United States vessels, including questions of seamen's wages, is likewise secured by treaties with numerous European governments; also the right to claim deserters from American vessels.

The powers of consuls to adjust damages suffered by American vessels at sea, and in all matters of wrecks and salvage, are also secured by a great number of treaties; and in all cases of shipwrecks of American vessels within their respective consular districts, it is the duty of our consuls, so far as the laws of the country will permit, to take all proper and necessary measures, as well for saving such vessels and their cargoes as for storing and securing the merchandise reclaimed and taking an inventory of the same; and to see that all such property is restored to its rightful owner.

Our consuls are specially authorized and required to receive the protests of ship masters, ships' officers and crews, or other persons interested, in relation to any and all matters affecting the interests of American citizens.

Consuls are also authorized to act as administrators on the estates of all citizens of the United States dying intestate within their jurisdiction and leaving no legal representative or partner in trade. Indeed, this is one of the most sacred and responsible trusts imposed by their office, and in this respect they directly represent their government. The consul is the only person who can legally touch such property, and it is made his duty by law to take charge of the same for the benefit of the legal heirs of the deceased. A consular officer by the law of nations is the provisional conservator of all property within his district belonging to his countrymen deceased therein. He has no right as a consular officer, apart from the provisions of treaty, to administer in the local courts, but he is author-

ized to collect, preserve, and guard the effects, or to assist others in collecting and transmitting them to the United States. A consular officer may always intervene, in the local courts or elsewhere, by way of observing the proceedings, and he has the right to be present at all proceedings affecting the estates of his countrymen, as their official and national representative. In most countries these rights are secured by express treaty stipulations.

Consuls are also instructed by law to provide sick, disabled or destitute seamen within their districts with suitable relief, and to send them at public expense to the United States. It is also their duty to return to the United States at public expense any minor who has gone abroad without the knowledge and consent of his parents or guardians, as a sailor or stowaway on board an American vessel.

Nearly all of these rights and duties of consuls are recognized by the usage of nations, and if they have not always been distinctly specified in our consular treaties it is because they have seemed too well understood to require special mention.

By the usage of most civilized nations consular officers, as such, have no acknowledged representative or diplomatic character, and are not entitled to the rights, privileges, and immunities of diplomatic officers. They have, however, a certain representative character as affecting the commercial interests of the country which they represent, which entitles them to the special notice and protection of the law of nations. They are regarded as public officers both of the country which appoints them and of the country which receives them. The office which they fill and the duties which they perform are *international*.

Generally speaking, consuls in European countries and in America may claim for themselves and their offices, not only such rights and privileges as have been specially conceded, but also such as have been sanctioned by custom and local laws and usages and have been enjoyed by their predecessors or by the consuls of other nations, unless a formal

notice has been given that these will not be extended to them.

By the general usage of nations, a consul may place the arms of his government over the doors of his office or residence. Permission is also given him to display the national flag over the consulate. A consul may claim inviolability for the consular seal and the archives and other property of his office, and their exemption from seizure or examination.

A consul is exempt from military duty and from serving on juries, and from other public duties, and his office and residence are exempt from the billeting of soldiers upon his premises. The generally accepted principle is this: that although a consul is not a public minister and cannot pretend to diplomatic prerogatives and privileges, he is, nevertheless, charged with a commission from his government, and is accepted as a public officer by the government where he resides; and he ought to enjoy such immunity from all official restraint, as will permit him to perform freely his duties. The sovereign who receives him tacitly engages to grant to him all the freedom and protection necessary to execute the functions and duties of his office with propriety.

A consul is, however, under public law, subject to the payment of taxes and municipal assessments on his property in the country where he resides, and in general he is subject to the civil and criminal jurisdiction of the country in which he resides. It is generally considered, however, that if a consul is not engaged in trade and does not own real property, he ought not to be subject to arrest or incarceration, except on a grave criminal charge, in which case he may either be punished by the local laws, or sent back to his own country.

The privileges of consuls who are engaged in trade are more restricted than are those consuls who are not so engaged. Many of the consular conventions of the United States contain what is commonly called the "most favored nation clause." In such cases our consular representatives

are entitled to claim as full rights and privileges as have been granted to consuls of other nations. In all such countries our consuls must look to those treaties for a full definition of their official rights and privileges.

The inviolability of the consular office and dwelling; of the archives and seal of the consulate; the exemption of the consul from arrest, from taxation, from military service, and from the obligation to appear as a witness in the local courts, are generally secured by special treaties, but not always. In countries where these exemptions have not been specially granted by treaty, the consul should look carefully to the established precedents and practice in such matters.

A large and important part of the duties of consuls at all maritime ports relates, of course, to shipping and navigation. The operations of merchant vessels form by far the most important function in international commerce, and a large ocean trade could not be carried on between different nations without a system of well established laws and regulations for the government of merchant ships and their crews while on the high seas and in the ports and waters of each other.

By the usage of nations, which has long since acquired the force of international law, every merchant vessel engaged in foreign trade is required to carry certain documentary or written evidence of an official character to show its nationality, its ownership, the real nature of its cargo, and the place of its destination. These documents are commonly known as the *ship's papers*, and usually include her official certificate of registry, her sea passport, her shipping articles and crew list, and also her charter, if she has one.

Whenever an American merchant vessel enters a foreign port for the purpose of trade, or for any purpose requiring the official aid of her consular representative, it is the duty of her master or captain to deliver forthwith to the consul all the ship's papers, and the failure to do so subjects the master to a heavy fine.

The object of requiring captains of merchant vessels to deliver the ship's papers into the custody of the American consul is too obvious to require much illustration. In the first place, the consul is the official representative at the port of the commercial interests of the country to which the ship belongs. He is specially sent there to facilitate the maritime and commercial operations of his country, and to protect the individual rights of his countrymen. He is the official organ and mouthpiece of communication with the local officers of the port where he resides. The custody of the ship's papers is necessary to place him in possession of the information needful for communicating officially with the customs and other authorities of the port. Moreover, in addition to the ordinary duties of his office, a consul of the United States is charged with various special duties in connection with our national revenue system, and the execution of our laws with regard to foreign immigration. These special duties not only render it necessary for him to have possession of the ship's papers of vessels from his country, but they impose upon him a vast amount of work and responsibility not generally given to consuls of other countries.

Before officially reporting the arrival of the vessel the consul is presumed to have examined the ship's papers, her manifests, her charter party, and her bill of health, and to have fully satisfied himself that the vessel has complied with all the usual requirements in such matters, and that no attempt has been made to violate or evade the customs laws or any of the rules and regulations of the port. His official certification of these facts to the authorities of the port is accepted without question, and the formal preliminaries necessary to be gone through with before the vessel can discharge or receive cargo are thus greatly facilitated.

One of the first duties requiring the attention of the consul after the arrival of a merchant vessel is to receive any protests or declarations which the captain, the sailors, or any of the passengers on board the vessel may choose to

make there, relating to or affecting the interests of the vessel, her crew, her cargo, or the interests of any citizen of the United States. The nature of such protests is various, and requires the most careful scrutiny and patient attention of the consul. They generally relate to damages to the ship or her cargo arising from the dangers incident to marine navigation; or to claims against the owners or charter parties of the vessel in matters affecting their liability as common carriers; or to insurance. Protests are also frequently made by captains of vessels or by the passengers or crew before the consul, in regard to mutinous conduct on board the vessel while at sea, and in regard to dangers to the cargo by fire or other accidents, or to events incident to her voyage.

Where vessels arrive in a damaged or unseaworthy condition, or the cargo has been injured from any cause, and protest has been made by the master or others, it may become the duty of the consul to order a survey of the ship to ascertain her true condition, and determine what had best be done in the interests of all concerned. For this purpose the consul is authorized by law to appoint inspectors to examine the ship's condition, and the condition of the cargo also, if necessary, and to report to him upon the same. The consul may approve the whole or any part of the inspector's report.

It sometimes becomes necessary, where ships have been badly damaged, for the master or captain to borrow the money needful for her repairs. For this purpose a bottomry bond must be prepared, legal notifications given, and various other acts performed by or acknowledged before the consul. In case the vessel is condemned, the consul may authorize its sale by public outcry, and the sale of the damaged cargo also. In short, all official acts relating to the sale of damaged, wrecked, stranded, or disabled merchant ships and their cargoes, and everything relating to salvage, insurance, bottomry bonds, and such matters, come specially within the purview of consular oversight and authority and demand his immediate attention.

Consular acts and certificates in all such matters are exceedingly important, as affecting the interests of American citizens, because when duly authenticated by the seal of his office, consular certificates in such cases are entitled to full faith in law in all the courts of the United States, and are frequently the only evidence which the party in interest is able to procure.

As long as an American merchant vessel continues in a foreign port the consul is charged with the duty of enforcing, by all legal agencies at his command, proper discipline and order on board, and also of making or causing to be made suitable examination into the sanitary condition of the vessel and the health of the crew.

Every merchant vessel, whether American or foreign bottom, before clearing from a foreign country for the United States, is required to first obtain from the consul at the port of departure a certificate or bill of health setting forth the true sanitary condition of the vessel, and a further certificate that she has duly complied with the rules and regulations for the government of seagoing vessels, and for the safety of the crew, the cargo, and the passengers.

A still more important consular duty relating to merchant shipping in foreign ports is the oversight which our consuls are required to give to alien immigrants leaving port either on American or foreign vessels.

The master of every vessel, whether foreign or American, carrying foreign immigrants on board destined for any port in the United States, is required by law to prepare for the Inspector of Immigration at the port of arrival a complete list or manifest of all the foreign immigrants on board. These manifests must also bear the certification of the United States Consul at the port at which the immigrants took passage, showing the name in full, the age, sex, and occupation of each immigrant; also the nationality, and whether married or single; whether able to read and write; the last place of residence; the place of destination beyond the point of landing; whether the

immigrant's passage has been paid by himself or by other persons or by any municipality, society, or corporation; whether he possesses any ready money, and how much; whether he has any relatives or friends in the United States, and who they are, and where they reside; whether the immigrant has ever been in any prison or almshouse, or been convicted of any infamous crime; whether he has any loathsome, contagious, or infectious disease; whether he is a polygamist; whether he is deformed or crippled; whether he is mentally sound, and whether he is under any contract for labor after he reaches the United States. These are only a portion of the facts to which a consul must officially certify as being true, from a personal examination of each immigrant, or that he believes them to be true, from the sworn statements of the master of the vessel.

If the consul has any reason to think that any foreign vessel is about to sail for the United States from the port where he resides, with immigrant passengers who are paupers or criminals or otherwise undesirable persons, it is his duty to protest instantly and forcibly to the local authorities at his port, and to notify them that such action is regarded by the United States as a violation of the comity which ought to characterize the intercourse of friendly nations.

The faithful execution of the immigration laws of the United States is largely confided to our consuls abroad. It is an onerous duty; one that requires great watchfulness, and one that oftentimes imposes a vast amount of routine work, if conscientiously performed.

Of the various routine duties of American consuls connected with merchant vessels, the most exacting are those which relate to the certification of invoices of goods and merchandise intended for importation into the United States. American consuls, in respect to goods and merchandise imported into this country, are given, under our tariff system, a sort of police jurisdiction over the merchant vessels of all nations and their inward cargoes. The tariff

laws of the United States require that all goods and merchandise of foreign production or manufacture, intended for importation into this country, shall be fully described by the importer in what is usually known as a consular invoice, giving a correct description of the goods or merchandise; the name of the place of manufacture or production; the time and place of purchase abroad; the actual value at the time of purchase or export; and the name of the vessel in which the goods are to be conveyed to the port of entry. The object of these provisions is to prevent frauds on the revenue of the Government and to assist the customs officers of the United States at the various ports of entry to estimate equitably and truly the fixed duties prescribed by the general tariff laws of the country. These invoices are made out in triplicate, and are required to bear the official certificate or attestation of the consular officer residing at the port or district from which the goods are imported. One copy of each invoice is transmitted by a consul to the United States Collector of Customs at the port where the goods are to be entered; one copy is given to the shipper of the goods; and the original invoices are all kept by the consul and filed among the permanent records of the consulate. At foreign ports where no American consulate has been established, the invoices may be certified by the consul of any other nation at amity with the United States.

The work of certifying these invoices, and the various acts and duties required of consuls in relation thereto, are by no means trifling. In large commercial ports many thousands of invoices are signed every year. In addition to filing them in his office, the consul must keep a permanent record of them in an invoice book especially designed for that purpose. At the end of each quarter the consul is required to make an abstract of his invoices, taken from the office records, and to transmit it to the Treasury and State Departments at Washington. He is also required to keep a record of all arrivals and departures of American vessels at his port, and to make a quarterly report of the same to the Department.

All invoices certified by the consul should be numbered consecutively in the order in which they are issued, and the originals filed among the permanent records of the consulate. In cases where samples are required, these should be labeled and filed likewise.

In addition to these special duties, every consul is expected to have an accurate knowledge of the conditions of the trade and commerce of the place where he is located, and especially of the market values of the different articles of commerce usually shipped from his port or district; and he is required to keep the Treasury and State Departments at Washington fully informed regarding all events of interest touching the industries, trade, commerce, and navigation of the country in which his consulate is located.

In short, American consuls are expected to be wide awake, and to keep the Government fully informed respecting everything that affects the commercial interests of this country. They are expected to keep a watchful eye for every new opening or opportunity for American trade and for every new market for the products and manufactures of their country. A consul is on the ground, and understands, or ought to understand, the conditions of trade where he resides. His official position gives him easy access to many avenues of information from which his countrymen engaged in private business are necessarily debarred. He can or should place himself in communication with the local departments of trade and other bureaux or sources of official information which are inaccessible even to diplomatic officers residing in the country. With such facilities at his command, there is scarcely a limit to the opportunities afforded a consular officer for obtaining the most valuable information for his country. If he is an intelligent and observing man, he is in a position to offer a thousand useful suggestions and to supply a world of the most valuable information to his country and to his countrymen, in matters of the very highest economic importance.

The duties of consular officers in respect to the development of foreign trade are of special interest at the present time, and the subject is attracting more attention than ever before. That it has become a subject of the most serious concern both in this country and in Europe, is demonstrated by the intense interest shown everywhere in the consular reports and bulletins published by the Department of State at Washington. Twenty years ago the "Commercial Relations of the United States" were published annuallly, in heavy volumes which nobody read. At the present time our Consular Reports are regularly published in daily, weekly, and monthly editions, and are read with the liveliest interest by business men, political economists, and statesmen, all over the world.

Aside from purely routine commercial duties, our consuls are entrusted with a sort of police jurisdiction over the merchant vessels of their country and their crews while in the territorial waters or ports of foreign nations. The extent of such jurisdiction or authority depends both upon treaty stipulations and the usage of nations.

By the usage of nations, which has acquired the force of international law, merchant ships while on the high seas are regarded, for all the purposes of national jurisdiction, as being within the territory of the country to which they belong, and under the protection of the flag which they carry. In theory, they form a part—a floating portion—of the national territory. The flag which covers them is not only a symbol of their nationality; it signifies absolute and exclusive national authority and jurisdiction over the vessel, her crew, her cargo, and everyone on board. Every act of such vessel while on the open seas, and every act of any person on board, is in theory an act committed within the territory of the nation to which the vessel belongs and under whose flag she sails, as much as though the ship were lying in a port or harbor of that country.

When such vessels, however, enter the harbors or ports of a foreign country, a different rule comes into operation.

It is a part of the law of civilized nations that when a merchant vessel of one country voluntarily enters the port of another for the purposes of trade, it subjects itself to the laws of the place to which it goes, unless by treaty or otherwise the two countries have come to some different understanding. American and English judges have uniformly recognized the right of the courts of the country in which the port is situated to punish offenses committed by foreign merchant vessels, or crimes committed by persons on board them while lying in port.

From experience, however, it has long since been found that it is more convenient and beneficial to commerce for the local government to abstain from interfering with the internal discipline of the ship, and with the general regulation of the rights and duties of the officers and crew toward the vessel and among themselves. And so, by mutual consent or comity, it has come to be generally understood among civilized nations that all matters of discipline, and all things done on board which affect only the vessel or those on board or belonging to her, and which do not involve the peace and dignity of the country, or the tranquillity of the port, should be left by the local government to be dealt with by officials of the nation to which the vessel belongs, in such manner as the laws of that country or the interests of its commerce should require; in other words, left to be dealt with by the foreign consul. But if crimes are committed on board, of a character to disturb the peace and tranquillity of the country to which the port belongs, and where the vessel is lying, the offenders have never, by comity or otherwise, been entitled to any exemption from the operation of the local laws or from punishment by the local courts, if the local courts see fit to assert their authority.

The principle which governs the whole matter is this: Disorderly conduct on board merchant vessels while lying in a foreign harbor, which only disturbs the peace of the ship, or of those on board, but which does not affect the peace

or tranquillity of the public on shore or in the port, may be dealt with by the consul of the country to which the vessel belongs; but disorders which threaten to disturb the peace of the port or the public on shore may be suppressed by the local officials, and, if need be, the offenders may be arrested, taken off the vessel, and punished by the local authorities.

Exclusive jurisdiction is given, by treaty stipulations, to United States consuls over disputes of seamen and masters relating to discipline aboard American merchant ships in the ports of France, Belgium, Austria-Hungary, Denmark, Germany, Holland, Italy, and, in fact, nearly all the commercial nations of the world except England. It is a singular circumstance that the two greatest commercial and maritime nations on the face of the earth, closely akin to each other by blood, language, literature, and laws, have never entered into any special treaty on the subject of consular jurisdiction, or consular rights and privileges. United States consuls in Great Britain and British consuls in America, therefore, can exercise no jurisdiction or authority over the vessels and crews of their respective countries, except such as has been extended by mutual courtesy.

The Government of France has always been exceedingly liberal in the matter of consular jurisdiction. I have already referred to our first consular convention with that country. By the provisions of our present consular treaty with France, consuls of both nations enjoy exclusive charge of all matters relating to the internal order of merchant vessels of their nation, and the local authorities of each are not allowed by any pretext to interfere with their differences. This gives consuls a larger power over merchant ships and their crews than is generally granted by treaty.

Our treaty with Belgium is substantially the same as that with France; and yet, strange to say, the most notable conflicts of jurisdiction in our history have arisen out of the provisions of the treaties with those countries.

It is the policy of the United States to extend as far as

possible, by law and by treaty stipulation, the most ample consular protection for American sailors in foreign ports. Consuls of the United States are regarded as in a peculiar sense the protectors and advisers of our sailors. It is their duty to receive their protests and to listen to their complaints. Our consuls are especially charged with the duty of enforcing the laws of the United States in regard to extra wages and the relief of American seamen; to furnish all shipwrecked, disabled, and discharged seamen with transportation to the United States; and to provide for all who are sick or destitute within the district of their consulate.

THE CONSULAR SYSTEMS OF THE WORLD.

Enough has been said concerning the duties and functions of consuls to show that men who are to fill such offices should not only have some special preparation for the work, but should also possess some natural aptitude for the discharge of such duties. It is now generally recognized, both in this country and in Europe, that the requirements for real usefulness in the consular service include a more advanced degree of education and a knowledge of a more special character than is thought necessary for almost any other office. There is no office the duties of which, properly performed, are more varied and difficult, and scarcely any more laborious and responsible. The duties of consuls are so entirely different from those of all other agents of government, that they demand necessarily a special education and training.

Among all the great commercial nations of the world it has come to be the accepted theory that in order to maintain an efficient consular service the officers composing it should be selected and trained with as much care as officers for the army, the navy, or the judiciary. The uniform experience of all nations has been that wherever consular officers have been carefully selected and judiciously trained, young men of the highest education and ability have

willingly entered the service and have performed the most painstaking and difficult work, on a scanty salary, so long as the hope of a permanent career and of promotion in the service for merit is held out to them. The experience of all nations shows that the highest incentives to good work in the foreign service, as in every other service, are a permanent tenure of office during good behavior, with a fixed salary, and the hope of promotion or reward for faithful and meritorious service.

Acting upon this experience, the leading nations of Europe have adopted the practice of selecting candidates for consular and diplomatic appointments from among young men of advanced education, by means of open competitive examinations, and of appointing those who thus prove themselves suitably qualified, to inferior positions in which they may have an opportunity to rise in the service by regular degrees of promotion. Favor or discrimination based upon political opinions or affiliations of the individual officers, either before or after entering the service, is virtually unknown.

The candidate for appointment is required either to pass a strict technical examination, or to produce a degree from certain prescribed universities or schools, or more frequently to qualify in both these respects. Those who are accepted are usually assigned to probationary duty in the foreign office or at a consulate, and are subjected to practical tests of some other character. Neither appointment nor promotion is made to any particular post, but to the grade. Suspensions or dismissals are known as measures of discipline only, and the superannuated officer whose service has been faithful and honorable is usually retired on a pension.

In each of the European consular systems, as in our own, there is the customary division into salaried and unsalaried classes, and into grades of consuls general, consuls, vice-consuls, and commercial and consular agents. Unlike our own service, however, vice-consuls and other

inferior officers in the service, except merchant consuls, are permanent officers, with fixed salaries. No salaried consular officer is permitted to engage in trade. Unsalaried officers are generally selected by the superior consular officer in the district, who is responsible for their acts and who virtually controls their tenure of office.

Among European governments, France is distinguished for having the oldest, and, theoretically, the most perfect consular organization in existence. The Consular Code of France was systematically formulated by Count Mazarin, with whom it was a favorite saying that he never knew a good minister who had not been a good consul, and that he never knew a good consul who was not familiar with commercial treaties and the usages and principles of commercial and maritime law. Under the French system the consular and diplomatic services are intimately connected, and the practice of training a special corps of pupils for both branches of the foreign service in the same schools is peculiar to the French system. Every candidate for examination must hold a regular commission in the army or navy, or a degree of Bachelor of Laws, Arts, or Science, from certain designated schools, or from the national military or naval academy. All examinations for positions in the foreign service, whether consular or diplomatic, are strictly competitive. The examinations for pupil consuls include international law, English and German, political economy, diplomatic history, and commercial law. Pupils whose papers are thought sufficiently creditable to warrant their going any further are then subjected to a public oral examination in commercial geography, and maritime and customs law, in addition to the subjects just mentioned. The successful competitors in this second examination then become eligible for appointment as pupil consuls and for assignment to probationary duty. Those assigned to the consular service are thereafter styled pupils, and those to the diplomatic service, attachés.

Before receiving their commissions, however, consular pupils and diplomatic attachés alike are required to serve an apprenticeship of one year in the Board of Trade, and a second year in the Foreign Office, where they are systematically drilled in all the administrative forms of the diplomatic service. They are then sent to some legation or consulate for a third year of probationary service abroad; and after that they must undergo their third and final examination, which, when successfully passed, entitles them to a commission as vice-consul. No promotion from a vice-consulate can be made until after three years of service. From this period advancement in the service depends on individual intelligence and aptitude for the work, rather than upon the length of service. Every member of the regular foreign service holds his position for life or during good behavior, and receives a life pension when honorably retired.

In addition to the foregoing safeguards, a Committee of Consultation on Consulates was created by executive decree in 1891. It consists of twenty-five members composed of distinguished members of the Senate and Chamber of Deputies, and the nine Presidents of the leading chambers of commerce of France. It is made the duty of this committee to advise the Minister of Foreign Affairs on all matters pertaining to the consular service, particularly in connection with the development and promotion of trade.

The French have always taken a special pride in their foreign service, and the fame of many of the most distinguished French families was originally laid in the consular service. Colbert, the great Minister of Louis XIV, entered the service as Consul of France, when a young man; Talleyrand, the prince of French diplomatists and the famous Prime Minister of Napoleon, and de Guignes, the renowned Oriental scholar, each began life in the consular service; the Pichons, the de Lesseps, the Beauchamps, and scores of scholars and statesmen renowned in French history, are among the honored names of the French consular service.

Talleyrand's instructions to French consuls contain these remarkable sentences: "In foreign countries Frenchmen are judged by their consuls; and consuls are judged by their intelligence and their character. When you reflect that it depends on you whether the French nation will be respected abroad, you will understand the importance and dignity of your mission.

"It is the glory of France that her consular representatives abroad have no connection with business. The commercial nations of Europe have hastened to imitate the splendid consular system of France. With England it is quite different. Every English consul is either a trader on his own account or that of his Government. He employs every method to accumulate a fortune and to increase the fisc of his isle. In Holland the English consul is a commissioner; in Constantinople he is a trader; in the ports of the Mediterranean he is a pirate."

The last sentence was probably dictated by Napoleon himself, who despised the English, and sought to cast a slur upon them by calling them "a nation of shopkeepers."

It need scarcely be said that the consular service of Great Britain is generally conceded to be among the foremost, if not the first, in the world. It is certainly the most practical and useful. For more than two centuries England has maintained the commercial supremacy of the world, no less by the wisdom of her commercial policy than by the power of her great naval armament. Her consular system is essentially the outgrowth of her commercial policy. At every nook and corner of the earth where navigation and commerce can penetrate the union jack is to be seen flying above a British consulate, and at every mart and seaport in the whole circle of the earth the British consul is found—the *avant courier* of trade,—the herald and protector of British commerce.

The British consular service was established in its present form in 1825, and has since been twice partially remodeled; the last time by the Earl of Clarendon, in 1855.

Previous to 1825 the service had many of the defects which Talleyrand so caustically pointed out. Up to that time all appointments to the British foreign service had been made by the King, as a reward to political favorites and friends, very much in the same way that appointments are made to the service in this country at present. By the act of 1825 the system was adopted of placing the consular service under the control of the Foreign Office, and of making selections and appointments by means of competitive examinations, and of taking the service entirely out of politics. Since then the consular service has been the subject of frequent investigations by Parliamentary commissions, with a view to still further improving its efficiency. The evidence taken by these commissions has been published in the British Blue Books, and is very voluminous, and includes the experience and suggestions of all the leading statesmen, consuls and Presidents of the chambers of commerce and boards of trade in Great Britain. Every one interested in the subject of consular reform should read the reports of the British commissions. They are all practically unanimous in favoring the system of competitive examinations, of fixed salaries, of a life term of office; and against the practice of employing merchant consuls.

Candidates are not required to present diplomas from universities or technical schools, as in France and Germany; they are, however, required to satisfy the commission that they have a suitable command of the English language for clear and forcible expression. They must be able to read and write French correctly and fluently. They must also understand the language of the country to which they are to be sent sufficiently to be able to communicate with the authorities. They must pass satisfactory examinations in admiralty and commercial law, the laws of shipping and navigation, of bills of exchange, maritime contracts, insurance, bailments, and bottomry. They must also pass an examination on the principles of

international law, political economy, commercial geography, and history. Although candidates are not required in express terms to possess university degrees or diplomas, the examinations on all these subjects are so exhaustive that no one who has not taken a preparatory course in economics, international law, and political history could hope to qualify.

Candidates who are accepted by the commission, before assignment to their posts of duty, are required to spend at least three months in the Foreign Office, in order to become familiar with the forms of business. The first assignment to duty is usually to some inferior post.

In the examination of vice-consuls the tests are less severe, but more diverse; the aim being to set in every case the highest standards of intelligence and general culture, coupled with special knowledge of all subjects connected with consular and diplomatic employment. Vice-consuls must in all cases serve at least two years on probation.

The English Government makes a specialty of the consular service in the Orient, in Egypt, and in all Asiatic and non-Christian countries; the object being to secure men for this branch of the service who are not only conversant with European languages, laws, and polity, but who are highly educated in Oriental languages, literature, manners, and customs. To this end appointments to the service in Eastern countries are made by competitive examinations for the position of student interpreters for consulates and legations in those countries. The policy of the Government is to educate student interpreters at the Government expense, and under the eye of old and experienced officers in the service, and to offer a permanent career to all who enter such service.

Open competitive examinations are held periodically at the Foreign Office for young men who desire to enter the Oriental service. Those who pass successfully their preliminary examination are then sent at government expense to certain designated institutions of learning, usually to

Oxford, for a special course of two years in Oriental studies. The student before entering the school must give bond to cover any loss, in case he should leave the service or be dismissed for incompetence or misconduct. On receiving his degree in Oriental literature the student is assigned by the Foreign Office to some legation or consulate in the country where he expects to serve. At the British legations at Peking, at Constantinople, and at Teheran, the capital of Persia, a corps of these student interpreters are constantly employed in subordinate positions, and from time to time, as the needs of the service require, they are assigned to different consulates.

It is well understood that the development of the commerce of Great Britain in the Orient has been due in a large measure to the excellence of her consular system, and to the trained skill of the officers composing it. The ascendency of British trade and influence in the Far East has been attributed by competent authorities to this agency alone. The entire service is under the control of the foreign office, as in this country, with this difference, however, that the English consul can be immediately transferred from port to port, while the American consul cannot without a new appointment from the President. It is the duty of British consuls not only to familiarize themselves with ordinary routine work, but also to become conversant with any treaty stipulation, Act of Parliament, or Order in Council relating to foreign trade or to consular functions and duties, and especially with the laws and usages of trade of the country where he resides that may in any case affect the commercial interests of England. The consul's skill in mastering these subjects, and the results of the practical application of his knowledge of such matters in his official acts and relations, are all carefully scrutinized by his official superiors.

The consular service of Germany, although comparatively modern in its organization, is one of the most efficient in Europe. The service is divided into two classes,

professional and merchant consuls. Both classes are selected by the Foreign Office and appointed by the Emperor. All candidates for the professional or regular service must pass a preliminary examination in commercial and international law, and must have served at least three years in the civil service or at the bar. Before receiving a commission the candidate must also have served two years in a subordinate consular position abroad, and have passed his second or final examination.

It is well known that it is the aspiration of Germany to become the leading manufacturing and commercial nation of Europe. The government is fully alive to the importance of the consular service as an agency for the promotion of its foreign trade, and has recently, by order of the Emperor, appointed a commission, composed of the most experienced consuls in the service, to revise and reform the entire system.

In Russia a university degree or military rank takes the place generally of an examination; but original appointments are all made to the lowest grades, and advancement in the service depends upon efficiency, intelligence, and merit.

The consular systems of Belgium, Austria-Hungary, and Italy are each organized on the same general plan. Candidates for admission to the service are required, without exception, to pass a series of competitive examinations. All applicants must have had a degree of bachelor of laws from some designated university, or a certain rank conferred by the National Military Academy. Examinations are held once a year; these are widely advertised, and the examining boards are composed invariably of distinguished administrators in the civil or military service. A knowledge of French, German, and English is indispensable. Besides their diplomas, applicants are required to prove their proficiency in commercial and international law, consular and diplomatic history, and political economy. Candidates after passing successfully their first examinations are then

required to spend a year or more in the Foreign Office and to become familiar with the relations of the department to the foreign service, and all the administrative forms of business connected with the consular and diplomatic service.

In most European countries commercial museums have been founded similar to those in this country, for the exhibition of samples of products and manufactures of other nations and of the variety of home products most saleable abroad. In these institutions consular students and pupils are trained, with a view to the promotion of trade, and their success in this direction has in some instances (in Belgium, for example) attracted world-wide attention.

It has, in short, become recognized everywhere, except in the United States, that it will not do to trust the commercial interests of a great nation to officers who have not received a special course of study and training for the service.

It only requires a glance at the consular systems of the world to see that the organization and equipment of the foreign service of the United States is altogether antiquated and defective. It is plain that ours is the only great commercial nation of the world to-day where appointments to this branch of the civil service are made without special regard for personal fitness, and where candidates are eligible for appointment without a degree from some accredited university or school of diplomacy, or without special training of some sort. The United States is the only great civilized nation where appointments to the consular and diplomatic service depend upon political influence, and where the tenure of office is not permanent or during good behavior. Once appointed to a consular or diplomatic position, an American finds that, no matter what his peculiar fitness or qualifications may be, there is virtually no opportunity for advancement and no hope of adequate recognition or reward for honorable and meritorious services. As a rule, in our service there is no assurance, and really little probability that a consular or diplomatic officer.

no matter how well qualified he may be for his position, will be retained in office beyond the term of the administration which appoints him. At every change of administration, under our system, every one of these officers is liable to be removed, and they generally are removed, and for no other reason apparently than to make room for others who owe their appointment to political favor or party influence, rather than to personal fitness or special qualifications of any kind. Such a system in its very nature is incapable of developing a well ordered or efficient service; and such a service is as far removed from that of Great Britain or France as day is from night.

It is the opinion of everyone who has had experience in our foreign service that its chief defect is a lack of permanence. It is generally admitted that if appointments to the service were once made permanent, or during good behavior, there would be no difficulty in securing the very best ability for such offices.

It has been said, and it is probably true, that Congress is not likely to adopt for the diplomatic service a system of appointments for life, as such offices are essentially political in character.

It is claimed that as members of the diplomatic service occupy a peculiarly confidential relation to the administration, they should, therefore, be in political sympathy with the party in power. This argument, while it seems to have some force, is entirely overcome by the experience of other nations. No political party in France, or England, or Germany, would ever think of changing the personnel of their diplomatic corps because of a change of political parties at home. As consular duties are commercial and judicial in character, and not political, this argument is in no way applicable to them. There is no more reason for removing experienced consuls upon the change of administration than there would be for removing the president and officers of a bank or the clerks of a business house at the beginning of a new governmental administration.

Another serious defect of our consular and diplomatic system is, that we do not pay these officers sufficient salaries to enable them to live in a style becoming their rank and station. It has come to this, that nobody but a rich man can afford to accept a first-class mission or consulate abroad.

It should never be forgotten that one of the most important duties of an officer in the foreign service is hospitality. To be useful to his country, a consular or diplomatic officer must make the acquaintance of the leading officials of the country where he resides; he must receive and entertain them at his home and at his table; he must be on terms of friendly social intercourse with them, and in this way prepare himself for the occasion which may arise at any moment when he has some important end to gain. A clever minister or consul will accomplish much more at private conversations, amiable talks over a dinner table, or after it, than can be done by official dispatches. Diplomatic history is full of the most interesting and instructive illustrations of this fact.

Senator Sumner once expressed all this very well when he said that, "in order to preserve good foreign relations, it is not sufficient simply to have your representative living abroad as cheaply as he can afford to exist, because his social position is a very important factor in his power to be useful. Great facilities and great means of good understanding are best afforded by means of social intercourse, not only with the officials of the country, but with public men not in office. Your representatives, therefore, should be in such an easy position, with regard to money affairs, as to enable them to receive hospitably persons of all kinds, and I may say of all nations."

In answer to this it is sometimes said that our institutions are democratic and not monarchical; that our official equipment, etiquette, and manners should conform to our ideals of republican simplicity. This may be all very well in a sense; but it must occur to every thinking person that it is not a mere question of display; that even democracy,

in order to be successful, must at least be intelligent; that in order to obtain the respectful attention of other nations, we must first show a decent regard for their opinions, and sometimes even for their prejudices as well.

The real truth is that under all political forms human nature is the same. The true idea at the bottom of the whole matter is neither aristocratic display nor republican simplicity. It is human nature the world over to have respect for and to be influenced by good manners, good social qualities, and a high-bred and liberal hospitality. There is no country in the world where all this is better understood or more generally practiced than in the United States; and yet, strange as it may seem, as a people who understand life and human nature quite as well as any other, and at home bestow our hospitality more lavishly and in more princely fashion than any other, we send our official representatives abroad on a mean second-rate salary; and all this in the name of republican simplicity.

At home it is well enough for us to observe such manners and customs as may be best suited to our institutions; but when we send our agents to represent us abroad, let us remember, in the language of President Monroe, that "when we deprive them of the necessary means to enter the social circle to which they belong, we reduce them at once to ciphers."

With regard to the special qualifications necessary for a good consul it is really difficult to speak. Mr. Gladstone, who perhaps understood the duties and necessary qualifications of consular and diplomatic officers as thoroughly as any English statesman, declared in his testimony before the British Civil Service Commission that there is no branch of the civil service that calls for such a diversity of attainments, such a mass of practical knowledge and general information. The duties of these officers, says he, are so peculiar, so infinitely varied and so important, that they demand something more than a special education and training. From ignorance of the peculiar duties of this

class of officers, the general public in this country fails to perceive that, while in all other branches of government service great personal qualifications are *desirable*, they are absolutely *essential* in our Consular and Diplomatic Service.

There is one qualification which every officer in the foreign service should possess: he should always be able to speak the language of the country to which he is accredited, if not fluently, at least well enough to read and understand official communications addressed to him, so that he will not be compelled, as is too often the case, to take some unknown foreigner into his confidence and service to translate them. Once let it be known that a minister or consul has to employ a foreign interpreter, and his official correspondence and state secrets are at the command of anybody or any government that may deem them worth paying for.

It is almost easier to say what a consul should not be than to enumerate all that he should be. In many instances, and perhaps in the majority of cases, a consul's duties do not so much make calls for special knowledge as for unusual abilities of a common character. "To know exactly what you want," says one writer, "to see quickly what is practicable; to take everything by its right handle; never to be in a hurry; not to contradict; not to irritate; not to threaten; above all things, to remember that the person you are talking with knows his own interest fully as well as you know yours." All this is good advice, but it is almost as good in private as in official life. The difference is in the weight and magnitude of the interests concerned, rather than in their special character.

When we are told that consular duties demand a liberal education, good sense, penetration, patience, a calm judgment, an unruffled temper, a pleasant address, and agreeable manners, we are ready to say that these are things which everybody should have who has to mingle in the affairs of life; and so they are; but everybody does not need them in the same degree.

A consul is not ordinarily expected to deal offhand with nice and delicate questions of public law, or with questions relating to the interpretation of treaties; but he is expected to know an easy question from a difficult one, and to be able to execute with intelligence, tact, and judgment the instructions of his government in relation to all such matters.

To be well equipped for his duties and to be really useful to his country, a consul, in addition to a liberal education, for a foundation, should have a highly specialized knowledge of international and commercial law, political economy, commercial and consular treaties, commercial geography, and modern languages.

Sir Charles Dilke, who is recognized in England and in this country as one of the ablest experts in commercial and foreign affairs, has recently advocated the establishment of government schools for training consular and diplomatic pupils on the lines above mentioned.

The intense interest with which the development of the consular service is watched, of late years, both in this country and in Europe, is certainly one of the most significant indications of the great change which is taking place in the economic aspiration of the commercial nations of the world.

It is the consensus of opinion among those who have made a study of our foreign policy and of our future commercial possibilities, that our consular service must and will be, not only greatly enlarged hereafter, but that the standard of the service must also be raised to meet the requirements of our commercial expansion.

In the last publication of our Consular Reports at Washington, the important announcement is made that the United States is now the leading exporting nation of the world. Last year our exports amounted to the enormous sum of $1,500,000,000 in value, an increase of nearly 300 per cent. in twenty-five years. During the same period the export trade of Germany increased 73 per cent., that of Great Britain 34 per cent., and that of France 5 per cent.

These statistics are highly significant, and seem fully to justify the recent declaration of Senator Lodge of Massachusetts, that "the United States, in the progress of their economic development are rapidly marching toward the commercial supremacy of the world."

Nothing seems more certain, therefore, than that the foreign relations of the United States—commercial and diplomatic—instead of diminishing, will hereafter rapidly increase in intimacy and importance. The natural and necessary consequence of our commercial expansion must be that our foreign policy, our Consular and Diplomatic Service, and all the various agencies for the promotion and protection of our foreign trade, will hereafter, as time advances, more and more become the serious study of the American people.